OPERATION MATHS

5th Class

Answer Booklet

A Complete Primary Maths Programme

Edco PRIMARY MATHS

OPERATION MATHS 5TH CLASS: ANSWERS

Pupils' Book

PAGE 1

1. (a) 3,000 + 200 + 10 + 2
   (b) 5,000 + 400 + 60 + 2
   (c) 7,000 + 600 + 80 + 1
   (d) 1,000 + 300 + 90 + 6
   (e) 30,000 + 2,000 + 100 + 40 + 9
   (f) 50,000 + 3,000 + 20 + 4
   (g) 60,000 + 6,000 + 400 + 5
   (h) 40,000 + 5,000 + 300 + 10 + 2
   (i) 30,000 + 7,000 + 100 + 70
   (j) 10,000 + 4,000 + 200 + 4
   (k) 10,000 + 8,000 + 10 + 1
   (l) 10,000 + 9,000 + 200 + 20
2. (a) 32,605 = 30,000 + 2,000 + 600 + 5
   (b) 29,017 = 20,000 + 9,000 + 10 + 7
   (c) 51,260 = 50,000 + 1,000 + 200 + 60
   (d) 11,613 = 10,000 + 1,000 + 600 + 10 + 3
   (e) 10,101 = 10,000 + 100 + 1
   (f) 15,041 = 10,000 + 5,000 + 40 + 1
   (g) 39,019 = 30,000 + 9,000 + 10 +9
   (h) 70,038 = 70,000 + 30 + 8
   (i) 56,502 = 50,000 + 6,000 + 500 + 2
   (j) 11,112 = 10,000 + 1,000 + 100 + 10 + 2
3. (a) (i) 66,405
   (ii) 1,396
   (b) (i) 70,038
   (ii) 10,101

PAGE 2

4. (a) 11,284 = 10,000 + 1,000 + 200 + 80 + 4
   (b) 53,729 = 50,000 + 3,000 + 700 + 20 + 9
   (c) 87,647 = 80,000 + 7,000 + 600 + 40 + 7
   (d) 32,606 = 30,000 + 2,000 + 600 + 6
   (e) 46,712 = 40,000 + 6,000 + 700 + 10 + 2
   (f) 78,290 = 70,000 + 8,000 + 200 + 90
   (g) 24,118 = 20,000 + 4,000 + 100 + 10 + 8
   (h) 13,209 = 10,000 + 3,000 + 200 + 9
   (i) 32,597 = 30,000 + 2,000 + 500 + 90 + 7
5. (a) eleven thousand, two hundred and eighty-four
   (b) fifty-three thousand, seven hundred and twenty-nine
   (c) eighty-seven thousand, six hundred and forty-seven
   (d) thirty-two thousand, six hundred and six
   (e) forty-six thousand, seven hundred and twelve
   (f) seventy-eight thousand, two hundred and ninety
   (g) twenty-four thousand, one hundred and eighteen
   (h) thirteen thousand, two hundred and nine
   (i) thirty-two thousand, five hundred and ninety-seven
6. (a) 42,356
   (b) 78,803
   (c) 92,609
   (d) 66,110
   (e) 23,915
   (f) 84,708
   (g) 12,920
   (h) 15,411
7. (a) 19,746
   (b) 32,415
   (c) 84,301
   (d) 95,049
   (e) 600
   (f) 4
   (g) 50
   (h) 10,000
   (i) 21,568
   (j) 57,394
   (k) 100
   (l) 6,000

PAGE 3

Work It Out!

(a) 32,176
(b) 26,632
(c) 73,587
(d) 97,442
(e) 52,206
(f) 45,410
(g) 96,189
(h) 61,253

PAGE 4

1. (a) 5 units = 5
   (b) 6 hundreds = 600
   (c) 3 thousands = 3,000
   (d) 0 tens = 0
   (e) 5 hundreds = 500
   (f) 2 ten thousands = 20,000
   (g) 85 thousands = 85,000
   (h) 75 tens = 750
   (i) 18 hundreds = 1,800
   (j) 9 ten thousands and 8 units or 90,008 units = 90,008
   (k) 3 thousands and 2 tens or 302 tens = 3,020
   (l) 4 ten thousands and 8 hundreds or 408 hundreds = 40,800
   (m) 2 thousands and 5 hundreds or 25 hundreds = 2,500
   (n) 7 hundreds, 1 ten and 3 units or 713 units = 713
   (o) 6 ten thousands, 6 thousands and 4 hundreds or 664 hundreds = 66,400
   (p) 4 ten thousands, 8 hundreds, and 7 units or 40,807 units = 40,807

(q) 2 thousands, 6 hundreds and 4 units or 2,604 units = 2,604
(r) 7 ten thousands and 2 tens or 7,002 tens = 70,020

3. (a) 23,165
(b) 2,546
(c) 20,116
(d) 12,755

4. (a) 94,458
(b) 67,718
(c) 56,482
(d) 96,128

5. (a) 19,008, 36,467, 49,020, 72,265
(b) 32,483, 55,421, 82,348, 96,571
(c) 28,214, 28,412, 38,241, 38,421
(d) 51,596, 55,916, 55,961, 56,159
(e) 14,003, 14,030, 14,033, 14,300
(f) 64,019, 64,109, 64,110, 64,112

Work It Out!

(a) Thirty-one thousand and sixteen
(b) 40,000 + 8,000 + 600 + 3
(c) 6 tens = 60
(d) 65,310
(e) 14,789
(f) 71,896
(g) 90,753
(h) 96,032
(i) 0

PAGE 5

1. (a) 11,570
(b) 82,660
(c) 13,980
(d) 74,330
(e) 65,840
(f) 76,640
(g) 29,500
(h) 57,760
(i) 21,820
(j) 38,620
(k) 94,510
(l) 61,250
(m) 91,420
(n) 81,300
(o) 49,610
(p) 47,060
(q) 52,010
(r) 33,010

2. (a) 11,600
(b) 82,700
(c) 14,000
(d) 74,300
(e) 65,800
(f) 76,600
(g) 29,500
(h) 57,800
(i) 21,800
(j) 38,600
(k) 94,500
(l) 61,200
(m) 91,400
(n) 81,300
(o) 49,600
(p) 47,100
(q) 52,000
(r) 33,000

3. (a) 12,000
(b) 83,000
(c) 14,000
(d) 74,000
(e) 66,000
(f) 77,000
(g) 29,000
(h) 58,000
(i) 22,000
(j) 39,000
(k) 95,000
(l) 61,000
(m) 91,000
(n) 81,000
(o) 50,000
(p) 47,000
(q) 52,000
(r) 33,000

4. (a) (i) 13,000
(ii) 13,000
(iii) 13,000
(iv) 34,000
(v) 34,000
(vi) 34,000
(vii) 56,000
(viii) 56,000
(ix) 56,000

5. (a) 29,000
(b) 18,000
(c) 40,000
(d) 26,000

Work It Out!

(a) 43,455, 43,456, 43,457, 43,458, 43,459, 43,460, 43,461, 43,462, 43,463, 43,464
(b) (i) 86,450 (ii) 86,549
(c) (i) 96,500 (ii) 97,499

PAGE 6

1. (a) (i) 0.006, $\frac{6}{1000}$
(ii) 0.994, $\frac{994}{1000}$
(b) (i) 0.045, $\frac{45}{1000}$
(ii) 0.955, $\frac{955}{1000}$
(c) (i) 0.5, $\frac{500}{1000}$
(ii) 0.5, $\frac{500}{1000}$
(d) (i) 0.2, $\frac{200}{1000}$
(ii) 0.8, $\frac{800}{1000}$
(e) (i) 0.25, $\frac{250}{1000}$
(ii) 0.75, $\frac{750}{1000}$
(f) (i) 0.435, $\frac{435}{1000}$
(ii) 0.565, $\frac{565}{1000}$

2. (i) 0.5, $\frac{500}{1000}$
(ii) 0.994, $\frac{994}{1000}$

3. (i) 0.006, $\frac{6}{1000}$
(ii) 0.5, $\frac{500}{1000}$

4. (a) c
(b) e
(c) d

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5. (a) It equals one whole.
(b) (a) $\frac{3}{500}$
(b) $\frac{9}{200}$
(c) $\frac{1}{2}$
(d) $\frac{1}{5}$
(e) $\frac{1}{4}$
(f) $\frac{87}{200}$

Work It Out!

(a) (i) $\frac{234}{1000}$ m, 0.234 m, two hundred and thirty-four thousandths
(ii) $\frac{766}{1000}$ m, 0.766 m, seven hundred and sixty-six thousandths
(b) (i) $\frac{750}{1000}$, 0.75, seven hundred and fifty thousandths (or $\frac{3}{4}$)
(ii) $\frac{250}{1000}$, 0.25, two hundred and fifty thousandths (or $\frac{1}{4}$)

1. (a) 2.222 or $2\frac{222}{1000}$
(b) 3.333 or $3\frac{333}{1000}$
(c) 4.444 or $4\frac{444}{1000}$

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2. (a) (i) $1\frac{326}{1000}$
(ii) 1.326
(b) (i) $2\frac{239}{1000}$
(ii) 2.239
(c) (i) $3\frac{107}{1000}$
(ii) 3.107
(d) (i) $1\frac{204}{1000}$
(ii) 1.204
(e) (i) $0\frac{356}{1000}$
(ii) 0.356
(f) (i) $0\frac{603}{1000}$
(ii) 0.603

(g) (i) $0\frac{460}{1000}$
(ii) 0.46
(h) (i) $0\frac{75}{1000}$
(ii) 0.075

3. 3.107
4. 0.075
5. (a) $\frac{6}{10} = 0.6$
(b) $\frac{3}{100} = 0.03$
(c) $\frac{8}{100} = 0.08$
(d) $\frac{1}{1000} = 0.001$
(e) $\frac{7}{1000} = 0.007$
(f) $\frac{6}{1000} = 0.006$
(g) $\frac{9}{1000} = 0.009$
(h) $\frac{14}{100} = 0.14$
(i) $\frac{25}{100} = 0.25$
(j) $\frac{608}{1000} = 0.608$
(k) $\frac{407}{1000} = 0.407$
(l) $\frac{83}{1000} = 0.083$
(m) $\frac{92}{1000} = 0.092$
(n) $\frac{12}{1000} = 0.012$
(o) $\frac{24}{1000} = 0.024$
(p) $\frac{67}{1000} = 0.067$
(q) $\frac{235}{1000} = 0.235$
(r) $\frac{428}{1000} = 0.428$
(s) $\frac{739}{1000} = 0.739$
(t) $1\frac{542}{1000} = 1.542$
(u) $2\frac{348}{1000} = 2.348$

Work It Out!
(c) 0.005
(d) 5

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1. (a) (i), (iii), (v), (vi)
(b) (i), (ii), (iv), (vi)
(c) (i), (iii), (vi)
(d) (i), (ii), (vi)
(e) (i), (ii), (v)
(f) (ii), (v)

2. (a) (i) 0.2, 2 tenths
(ii) 20, 2 tens
(iii) 0.002, 2 thousandths
(iv) 2, 2 units
(b) (ii) 20, 2 tens

3. (a) (i) 0.8, 8 tenths
(ii) 80, 8 tens
(iii) 0.008, 8 thousandths
(iv) 0.08, 8 hundredths
(b) (ii) 80, 8 tens

4. (a) (i) 0.09, 9 hundredths
(ii) 9, 9 units
(iii) 0.009, 9 thousandths
(iv) 0.9, 9 tenths
(b) (iii) 0.009, 9 thousandths

5. (a) (i) 5, 5 units
(ii) 0.005, 5 thousandths
(iii) 0.05, 5 hundredths
(iv) 50, 5 tens
(b) (ii) 0.005, 5 thousandths

PAGE 10

6. (a) $\frac{4}{10}$
(b) $\frac{8}{100}$
(c) $\frac{4}{100}$
(d) $\frac{1}{10}$
(e) $\frac{8}{1000}$
(f) $\frac{95}{1000}$ or $\frac{9}{100} + \frac{5}{1000}$
(g) $\frac{83}{1000}$ or $\frac{8}{100} + \frac{3}{1000}$
(h) $\frac{4}{1000}$
(i) $\frac{41}{100}$ or $\frac{4}{10} + \frac{1}{100}$
(j) $\frac{3}{100}$
(k) $\frac{94}{10}$ or $9\frac{4}{10}$
(l) $\frac{20}{10}$ or 2
(m) $\frac{709}{1000}$ or $\frac{7}{10} + \frac{9}{1000}$
(n) $\frac{402}{1000}$ or $\frac{4}{10} + \frac{2}{1000}$
(o) $\frac{5001}{1000}$ or $5\frac{1}{1000}$
(p) $\frac{465}{1000}$ or $\frac{4}{10} + \frac{6}{100} + \frac{5}{1000}$
(q) $\frac{786}{1000}$ or $\frac{7}{10} + \frac{8}{100} + \frac{6}{1000}$
(r) $\frac{2646}{1000}$ or $2\frac{6}{10} + \frac{4}{100} + \frac{6}{1000}$
(s) $\frac{851}{100}$ or $8\frac{5}{10} + \frac{1}{100}$
(t) $\frac{507}{100}$ or $5\frac{7}{100}$

1. (a) 0.789, 0.843, 0.859
(b) 0.241, 0.263, 0.362
(c) 0.986, 0.989, 0.99
(d) 0.2, 0.42, 0.865
(e) 0.06, $\frac{66}{1000}$, $\frac{6}{10}$
(f) $\frac{37}{100}$, 0.467, 0.7

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2. (a) 7.316, 3.176, 1.367
(b) 0.944, 0.934, 0.415
(c) 0.9, 0.78, 0.523
(d) 6.514, 6.451, 6.415
(e) $\frac{3}{10}$, $\frac{33}{1000}$, 0.03
(f) 0.736, 0.67, $\frac{6}{10}$

3. (a) 5
(b) 3
(c) 7
(d) 5
(e) 1
(f) 3
(g) 7
(h) 2
(i) 14
(j) 25
(k) 32
(l) 95
(m) 61
(n) 81
(o) 60

4. A. 4.46
B. 4.475
C. 4.483
D. 4.5
E. 4.518
F. 4.534
G. 7.98
H. 7.991
I. 8
J. 8.015
K. 8.041
L. 8.053

5. (i) 4.46, 4.475, 4.483
(ii) 4.5, 4.518, 4.534
(iii) 7.975, 7.991, 8, 8.015, 8.041, 8.053
(iv) none

6. 10.176, 10.181, 10.184, 10.189, 11.148, 11.184

Work It Out!
(c) (i) 13.579
(ii) 97.531
(d) 75.319
(e) 35.791

PAGE 12

1. (a) (i) 13,500
(ii) April
(b) (i) 30 hours
(ii) 300 hours
(iii) 3,000 hours

2. (a) (i) 36.525
(ii) Eighth month
(b) (i) 40,000
(ii) Eighth week

Work It Out!
1. (a) 46,366
(b) 25,770
(c) 46,383
(d) 97,531
2. (a) 92.486
(b) 46.853

PAGE 13

1. (a) Right
(b) Straight
(c) Obtuse
(d) Acute
(e) Obtuse
(f) Reflex
(g) Obtuse
(h) Right
(i) Acute

(j) Straight
(k) Reflex
(l) Obtuse
(m) Reflex
(n) Obtuse
(o) Obtuse

PAGE 14

4. (a) Examples: 6:00, 3:49 and 8:11
   (b) Examples: 3:00, 9:00, 10:38, 6:49 and 12:49
   (c) Examples: 6:31 to 6:59 and 1:36 to 1:59
   (d) Acute angle, when it is pressed/closed. It will be a straight angle when opened to fit the staples.
   (e) Three (acute, right and obtuse)
1. (a) To measure angles in both directions
   (b) 180°
   (c) Circle
   (d) 360°
   (e) Measure the acute side and then subtract the measure of the acute angle from 360°.

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2. (a) 30°
   (b) 120°
   (c) 20°
   (d) 145°
3. (a) 55°
   (b) 25°
   (c) 123°
   (d) 13°
4. (a) 343°
   (b) 346°
5. (a) (i) A, B, C and D each = 90°
   (ii) E = 115°, F = 155°, G = 28°, H = 62°
   (iii) I = 56°, J = 90 , K = 34°
   (iv) L, M, N, O, P and Q each = 120°
   (v) V = 110°
   U = 110°
   T = 100°
   S = 120°
   R = 100°
   (vi) W, X and Y each = 60°
   (b) All the angles of the triangles add up to 180°, the quadrilaterals add up to 360°, a pentagon adds up to 540° and a hexagon adds up to 720°.
6. (a) Acute
   (b) Obtuse
   (c) Right
   (d) Acute
   (e) Reflex
   (f) Acute
   (g) Acute
   (h) Reflex
   (i) Straight
   (j) Obtuse
   (k) Reflex
   (l) Obtuse

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8. (a) 30°
   (b) 90°
   (c) 150°
   (d) 180°
   (e) 270°
   (f) 66°
   (g) 108°
   (h) 162°
   (i) 312°
9. (a) Acute
   (b) Right
   (c) Obtuse
   (d) Straight
   (e) Reflex
   (f) Acute
   (g) Obtuse
   (h) Obtuse
   (i) Reflex

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Work It Out!

(a) (i) 45°
(ii) 40°
(iii) 50°
(iv) 50 °
(v) 43°
(vi) 58°
(vii) 126°
(viii) 97°

(b) (i) 120°
(ii) 55°
(iii) 118°
(iv) 135°
(v) 90°
(vi) 23°

PAGE 19

1. (b) Obtuse scalene triangle
   (c) Acute equilateral triangle
   (d) Acute scalene triangle
   (e) Acute isosceles triangle
   (f) Acute equilateral triangle

PAGE 20

Work It Out!

(a) 31°
(b) (i) 8 cm (ii) 60°
(c) 90° and 53°
(d) (i) Sides = 3 cm each, Angles 60° each
   (ii) Sides = 2.3 cm, 2.7 cm and 2.1 cm, Angles = 75°, 55° and 50°
   (iii) Sides = 2.2 cm, 2.2 cm and 1.5 cm, Angles = 70°, 70° and 40°
   (iv) Sides = 3.5 cm, 1.9 cm and 4.6 cm, Angles = 24°, 110° and 46°
(e) (i) Acute equilateral triangle
   (ii) Acute scalene triangle
   (iii) Acute isosceles triangle
   (iv) Obtuse scalene triangle
1. (a) (i) Parallelogram
   (ii) Rhombus
   (iii) Rectangle
   (iv) Irregular quadrilateral
   (v) Square

PAGE 21

3. (a) C
   (b) A, B, C, D and E
   (c) A, B, C, D and E
   (d) No, because it isn't possible to draw a trapezium with a reflex angle.
   (e) A: 1, B: 2, C: 1, D: 1 and E: 1 pair(s) of parallel lines
   (f) Yes
   (g) A and D
   (h) A: isosceles trapezium,
   B: parallelogram,
   C: scalene trapezium,
   D: isosceles trapezium,
   E: scalene trapezium
4. (a) (i) Roof
   (ii) The bridge contains isosceles trapeziums (three triangles in a row) and parallel-ograms (two triangles side by side).
   (iii) 32 of the shapes are trapeziums.

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1. (a) Hexagons and equilateral triangles

(b) Squares, hexagons and equilateral triangles
(c) Equilateral triangles and squares

PAGE 23

1. (a) (i) A, C, F, G, M, N and O
(ii) D, E and P
(iii) F, G, H, J, K, M and N
(iv) D
(v) F, G, M and N
(b) 2-D shapes with line of symmetry: A, B, D, E, G, H, I, J, K, L, N and P
(i) B, E, J, K, L and P
(ii) A, B, E, G, H, I, J, K, L and P
(iii) B, D, J, K, N and P
(c) (i) D, E, F, G, J, K, N and P
(ii) D, E, O and P
(iii) A, C, F, G, H, J, K, M, N and O
(e) (i) A, C and O
(ii) E, F, G, M, N and P
(iii) E, F, N and P

PAGE 24

1. (a) 1.6
(b) 1.8
(c) 0.19
(d) 0.22
(e) 0.026
(f) 0.026
(g) 4.5
(h) 0.44

2. (a) 8.48
(b) 9.69
(c) 9.53
(d) 9.36
(e) 728
(f) 769
(g) 915
(h) 939

3. (a) Any number, but you will always have to add two first
(b) Only two
(c) 61,600 (add 15,000 and 25,000 first)

PAGE 25

Work It Out!
(a) Neither – they are both the same.
(b) 34,560
(c) 45,140
(d) €10.70
(e) 5.4 m

1. (a) 65,327: answer should be bigger because it's addition
(b) 59,971: answer shouldn't be smaller; must have used subtraction

2. (a) 10.4
(b) 6.8
(c) 7,474
(d) 5,979
(e) 73,884
(f) 66,069

PAGE 26

4. (a) 7,000
(b) 3,000
(c) 70.00
(d) 50.00

5. (a) 7,000
(b) 4,000
(c) 80.00
(d) 60.00

6. (a) 7,393
(b) 3,427
(c) 78.17
(d) 54.66

Rounding tends to produce more accurate estimates than front-end, although it does depend on the numbers.

Work It Out!
(a) Exact because they have units and therefore are probably not rounded.
(b) 80,000 or 90,000
(c) 10,000 or 20,000
(d) 4,000 or 3,000

1. (a) 32
(b) 3.2
(c) 0.32
(d) 320
(e) 3,200
(f) 32,000

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2. (a) (i) 26
(ii) 0.26
(iii) 2.6
(iv) 260
(v) 2,600
(vi) 26,000
(b) (i) 36
(ii) 0.36
(iii) 3.6
(iv) 360
(v) 3,600
(vi) 36,000
(c) (i) 5.2
(ii) 0.52
(iii) 5.2
(iv) 520
(v) 5,200
(vi) 52,000

3. (a) (i) 12
(ii) 0.12
(iii) 24,000
(iv) 2.4
(v) 240
(b) (i) 7
(ii) 0.7
(iii) 1,400
(iv) 140,000
(v) 0.14
(c) (i) 32
(ii) 0.32
(iii) 6,400
(iv) 64,000
(v) 6.4

4. (a) 28,000
(b) 0.42
(c) 0.034
(d) 380
(e) 3
(f) 3,600
(g) 0.068
(h) 46,000
(i) 7.2
(j) 7,000
(k) 660
(l) 0.62
(m) 10,800
(n) 8.6
(o) 0.9
(p) 0.084
(q) 1,040
(r) 82,000

5. (a) 350
(b) 3.7
(c) 43,000
(d) 0.25
(e) 290
(f) 0.031
(g) 69,000
(h) 6,300
(i) 7.1
(j) 0.067
(k) 730
(l) 0.47
(m) 1,500
(n) 0.25
(o) 19,000
(p) 2.2
(q) 0.033
(r) 900

Work It Out!
(a) 76,000
(b) 42,000
(c) 0.052 kg
(d) €5,400
(e) 3.2 m
(f) €5.12, €163.84

PAGE 28

1. (a) 35.64
(b) 97.439
(c) 29,137
(d) 5,611
(e) 46,305
(f) 1,008

2. (a) 15.64
(b) 77.439
(c) 29,117
(d) 5,591
(e) 46,285
(f) 988
3. (a) 596.9
(b) 851.45
(c) 71,902
(d) 52,168
(e) 7,005
(f) 1,026.05
4. (a) 396.9
(b) 651.45
(c) 71,702
(d) 51,968
(e) 6,805
(f) 826.05
5. (a) 96,807
(b) 41,846
(c) 40,629
(d) 67,173
(e) 22,003
(f) 81,958
6. (a) 94,807
(b) 39,846
(c) 38,629
(d) 65,173
(e) 20,003
(f) 79,958
7. (a) 65.114
(b) 86.841
(c) 76.064
(d) 33.004
(e) 12.107
(f) 32.1
8. (a) 65.004
(b) 86.731
(c) 75.954
(d) 32.894
(e) 11.997
(f) 31.99
9. (a) 24.257
(b) 43.709
(c) 35.06
(d) 52.1
(e) 47.001
(f) 28.001
10. (a) 24.255
(b) 43.707
(c) 35.058
(d) 52.098
(e) 46.999
(f) 27.999
11. (a) 29,438
(b) 37,534
(c) 49,156
(d) 87,303
(e) 55,995
(f) 47,679
(g) 54,569
(h) 42,946
(i) 89,983
(j) 77,125
(k) 12.51
(l) 44.165
(m) 64.48
(n) 89.55
(o) 56.306
(p) 28.022

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Work It Out!

(a) 0.75 kg
(b) 36,780

1. (a) 58,071
(b) 95,878
(c) 93,105
(d) 71,117
2. (a) 10,127
(b) 9,245
(c) 95,297
(d) 49,688
(e) 85,999
(f) 71,138
(g) 99,442
(h) 89,221
(i) 93,130
(j) 90,324
3. (a) 8.864
(b) 8.571
(c) 10.157
(d) 14.117

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4. (a) 2.088
(b) 10.108
(c) 10.459
(d) 10.638
(e) 7.452
(f) 7.888
(g) 7.812
(h) 12.7
(i) 19.378
5. (a) Smaller
(b) Larger

Work It Out!

(a) €50,000
(b) €73,000
(c) €180,000
(d) Round up so you have enough.
(e) €49,445; €72,340; €178,840

1. (a) 11,588
(b) 81,798
(c) 12,409
(d) 38,745

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2. (a) 6,631
(b) 5,727
(c) 48,935
(d) 14,966
(e) 16,765
(f) 26,160
(g) 34,688
(h) 58,487
(i) 13,746
3. (a) 1.194
(b) 0.373
(c) 2.761
(d) 2.856
4. (a) 3.557
(b) 6.898
(c) 1.471
(d) 3.333
(e) 1.891
(f) 0.894
(g) 3.834
(h) 1.924

Work It Out!

(a) Lap 4
(b) Lap 3
(c) 6.8 secs
(d) 191.353 secs
(e) 2.205 secs
(f) 9 mins

1. (a) 63,809
(b) 24,671
(c) 1.763
(d) 5.736

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2. (a) 18,763
(b) 51,536
(c) 1.582
(d) 2.733
(e) 73,525
(f) 44,030
(g) 2.942
(h) 3.173
3. (a) 42,843
(b) 42,033
(c) 20,811
(d) 30,429
(e) 37,364
(f) 15,898
(g) 9.252
(h) 6.219
(i) 5.54
(j) 5.543
(k) 0.795
(l) 13.402
4. (a) 159
(b) 445
(c) 185
(d) 418
(e) 278
(f) 346
(g) 225
(h) 415
(i) 239
(j) 638
(k) 4.6
(l) 4.7
(m) 1.3
(n) 1.6
(o) 15.1
(p) 0.61
(q) 3.54
(r) 1.28
(s) 4.46
(t) 4.45

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Work It Out!

(a) €555
(b) €7,660

1. (a) 23,098
   (b) 10.9 kg
2. (a) 10,560
   (b) 12.091
   (c) 12,454
   (d) 83,193
   (e) 13,290 km
   (f) (i) 30.539 million
   (ii) 68.382 million

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1. Karen; Oliver; Shane; John; Mia; Niall; Pearl; Corina

Work It Out!

(a) 165 mins
(b) 484 mins
(c) 759 mins
(d) €1256
(e) 23,040
(f) 5170 km

2. (a) 10 mins past 4; 4:10
   (b) 25 mins to 10; 9:35
   (c) 5 mins to 3; 2:55
   (d) 25 mins past 11; 11:25
3. (a) (i) 2 hrs 7 mins
   (ii) 4 hrs 3 mins
   (iii) 7 hrs 10 mins
   (b) (i) 72 mins
   (ii) 226 mins
   (iii) 392 mins

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Work It Out!

(a) (ii) Another way: 46 mins + 7 mins + 37 mins = 90 mins (1 hr 30 mins) 9:00 + 1 hr 30 mins = 10:30

(b) (ii) 2:55 – 36 mins = 2:19; 2:19 – 12 mins = 2:07; 2:07 – 7 mins = 2:00; 2:00 – 38 mins = 1:22 (45 mins – 7 mins = 38 mins)

1. (a) 47 mins
   (b) 1 hr 46 mins
   (c) 2 hrs 54 mins
   (d) 3 hrs 32 mins
2. (a) 3 hrs 50 mins
   (b) 8 hrs 19 mins
   (c) 36 hrs 45 mins
   (d) 50 hrs 05 mins
   (e) 34 hrs 45 mins

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3. (a) 1 hr 11 mins
   (b) 1 hr 39 mins
   (c) 3 hrs 39 mins
   (d) 6 hrs 53 mins
   (e) 10 hrs 40 mins
   (f) 3 hrs 46 mins
   (g) 3 hrs 45 mins

Work It Out!

(a) 4 hrs 35 mins
(b) 2 hrs 55 mins
(c) 7:20 p.m. or 19:20
(d) 1:15 p.m. or 13:15
(e) 24 mins 32 secs

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1. (a) 9 hrs 48 mins
   (b) 40 hrs 01 mins
   (c) 24 hrs 48 mins
   (d) 27 hrs 35 mins
   (e) 100 hrs
   (f) 119 hrs 25 mins
   (g) 84 hrs 50 mins
   (h) 72 hrs 32 mins
   (i) 122 hrs 54 mins
2. (a) 45 hrs 30 mins
   (b) (i) 2:04 p.m. or 14:04
   (ii) 41 hrs 24 mins
   (iii) 36 hrs 54 mins
   (c) Fionn works 37 hrs 05 mins; Siobhán works 35 hrs 30 mins
   (i) Fionn
   (ii) 1 hr 35 mins

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1. (a) 4:50 a.m.
   (b) 8:34 a.m.
   (c) 2:50 p.m.
   (d) 11:40 p.m.
   (e) 6:46 p.m.
   (f) 1:55 a.m.
   (g) 3:17 p.m.
   (h) 11:57 p.m.
2. (a) 07:24
   (b) 11:47
   (c) 15:55
   (d) 20:34
   (e) 23:23
   (f) 01:56
   (g) 12:12
   (h) 19:25
3. (a) 14:45
   (b) 04:20
   (c) 04:55
   (d) 19:25
   (e) 21:40
   (f) 11:15
5. 11:50 = 11:50 a.m.; 14:45 = 2:45 p.m.; 15:11 = 3:11 p.m.

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1. (a) Timeline from 08:00 to 18:30 showing some of the main events of the day
   (b) 10 hrs 25 mins
   (c) 1 hr 10 mins
   (d) 1 hr 6 mins
   (e) 15 mins
   (f) 4 hrs 45 mins
   (g) 1 hr 10 mins
   (h) 1 hr
   (i) The Nenagh meeting
   (j) 40 mins
   (k) 8 a.m.; 8:15 a.m.; 8:50 a.m.; 10 a.m.; 11:06 a.m.; 11:10 a.m.; 11:25 a.m.; 12:45p.m.; 1:55 p.m.; 2 p.m.; 3 p.m.; 4 p.m.; 5:11 p.m.; 5:30 p.m.; 6:10 p.m.; 6:25 p.m.
2. (a) 3 subjects
   (b) 3 hrs 20 mins
   (c) 2 hrs 30 mins
   (d) 2 hrs 30 mins
   (e) 4 hrs 10 mins
   (f) 3 hrs 20 mins
   (g) 7
   (h) 4 hrs 10 mins
   (i) Tuesday, Thursday and Friday
   (j) (i) 5 hrs (ii) 5 hrs
   (k) 15 hrs 50 mins
   (l) Timeline beginning at 10 a.m. and ending at 4 p.m. showing a few of the events at the correct times
   (m) 09:20–10:10; 10:10–11:00; 11:00–11:20; 11:20–12:10; 12:10–13:00; 13:00–14:00; 14:00–14:50; 14:50–15:40.

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1. (a) 7:00, 7:15, 7:40, 8:00, 8:30, 10:00, 12:00, 13:00, 14:15, 14:30, 15:30, 15:50, 17:00, 17:45, 18:30, 20:00, 21:00, 22:00.
   (b) 15 hours
   (c) 3 hours 10 minutes
   (d) Team meeting
   (e) 2 hours
   (f) 2 hours 25 minutes
   (g) 2 hours 15 minutes

(h) 1 hour 10 minutes
(i) 1 hour 10 minutes

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2. (a) A = acute angle, B = acute angle, C = right angle, D = reflex angle, E = obtuse angle
(b) A = 60°, B = 35°, C = 90°
(d) F = rectangle, G = square, H = right angled scalene triangle, I = isosceles trapezium, J = parallelogram.

3. (a) 1998 salary: $30{,}000 + 3{,}000 + 500 + 60 + 0 + \frac{5}{10}$, 2003 salary: $50{,}000 + 6{,}000 + 200 + 30 + 0 + \frac{9}{10}$, 2008 salary: $60{,}000 + 2{,}000 + 800 + 70 + 0 + \frac{3}{10}$, 2013 salary: $70{,}000 + 9{,}000 + 500 + 90 + 5 + \frac{1}{10}$, 2015 salary: $80{,}000 + 5{,}000 + 400 + 10 + 6 + \frac{5}{10}$
(b) 1998 salary: thirty-three thousand, five hundred and sixty euro and fifty cent, 2003 salary: fifty-six thousand, two hundred and thirty euro and ninety cent, 2008 salary: sixty-two thousand, eight hundred and seventy euro and thirty cent, 2013 salary: seventy-nine thousand, five hundred and ninety-five euro and ten cent, 2015 salary: eighty-five thousand, four hundred and sixteen euro and fifty cent
(c) 6 tens, 60; 6 thousands, 6,000; 62 thousands, 62,000; 1 tenth, $\frac{1}{10}$; 5 thousands and 4 hundreds; 5,400
(d) $51,856
(e) $5,821.4
(f) $67,121
(g) 1998 salary: $33,560, $33,600, $34,000
2003 salary: $56,230, $56,200, $56,000
2008 salary: $62,870, $62,900, $63,000
2013 salary: $79,600, $79,600, $80,000
2015 salary: $85,420, $85,400, $85,000

4. (a) 11.6 kg per person per day
(b) (i) 44.8 kg of oxygen
(ii) 64 kg of water + 32 kg of water for food = 96 kg
(iii) 16.2 kg

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1. (a) 30
(b) 640
(c) 260
(d) 5,080
(e) 2,470
(f) 6,950
(g) 19,830
(h) 28,750
(i) 135
(j) 97
(k) 6
(l) 8
(m) 4.6
(n) 95.4
(o) 2.03
(p) 0.46
(q) 61.08
(r) 70.45

2. (a) 0.9
(b) 3.7
(c) 1.8
(d) 34.6
(e) 76.9
(f) 60.4
(g) 345.8
(h) 840.5
(i) 2,345.8
(j) 3,267.1
(k) 1.57
(l) 0.83
(m) 0.04
(n) 0.037
(o) 0.061
(p) 0.004
(q) 0.705
(r) 0.346

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3. (a) 200
(b) 4,700
(c) 74,100
(d) 10,800
(e) 2,370
(f) 540
(g) 70
(h) 48
(i) 7
(j) 145
(k) 84.9
(l) 6.1

4. (a) 0.06
(b) 0.94
(c) 8.61
(d) 4.08
(e) 64.6
(f) 94.67
(g) 875.45
(h) 467.25
(i) 0.234
(j) 0.756
(k) 0.004
(l) 0.006

5. (a) 8,000
(b) 87,000
(c) 2,300
(d) 500
(e) 370
(f) 76

6. (a) 0.006
(b) 0.029
(c) 0.495
(d) 0.671
(e) 4.008
(f) 36.46

Work It Out!
(a) 2,500
(b) 13.5 km
(c) 0.005 l

1. (a) 0
(b) 9
(c) 14
(d) 10
(e) 126
(f) 37
(g) 0
(h) 82
(i) 347
(j) 860
(k) 1,880
(l) 0
(m) 12,400
(n) 8,600
(o) 0
(p) 2,789

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2. (a) (i) 20
(ii) 40

(iii) 171
(iv) 126
(v) 580
(vi) 500
(b) (i) 81
(ii) 36
(iii) 360
(iv) 320
(v) 120
(vi) 140
(c) (i) 160
(ii) 120
(iii) 80
(iv) 75
(v) 198
(vi) 216
(d) (i) 30
(ii) 25
(iii) 144
(iv) 135
(v) 560
(vi) 540
(e) (i) 54
(ii) 45
(iii) 380
(iv) 300
(v) 105
(vi) 125
(f) (i) 180
(ii) 100
(iii) 70
(iv) 90
(v) 234
(vi) 207

3. (a) (i) 16
(ii) 40
(iii) 48
(iv) 64
(v) 84
(b) (i) 72
(ii) 36
(iii) 88
(iv) 104
(v) 96
(c) (i) 32
(ii) 24
(iii) 52
(iv) 128
(v) 248
(d) (i) 40
(ii) 20
(iii) 120
(iv) 88
(v) 92
(e) (i) 24
(ii) 72
(iii) 68
(iv) 200
(v) 140
(f) (i) 72
(ii) 12
(iii) 96
(iv) 168
(v) 256

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Work It Out!

(a) (i) 15 × €4 = €60
(ii) 15 × €5 = €75
(iii) 8 × €8 = €64
(iv) 9 × (2 × 3 × 2) = €108

1. (a) (i) 180
(ii) 240
(iii) 350
(iv) 420
(v) 800
(vi) 1,500
(b) (i) 2,000
(ii) 900
(iii) 1,500
(iv) 1,200
(v) 24,000
(vi) 20,000
(c) (i) 15,000
(ii) 42,000
(iii) 54,000
(iv) 56,000
(v) 60,000
(vi) 80,000
(d) (i) 180
(ii) 800
(iii) 2,000
(iv) 24,000
(v) 15,000
(vi) 60,000

Work It Out!

(a) 48,000
(a) €6,000
(b) 780

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2. (a) 9 × 30 = 270 so 270 ÷ 9 = 30
(b) 3 × 80 = 240 so 240 ÷ 3 = 80
(c) 3 × 600 = 1,800 so 1,800 ÷ 3 = 600
(d) 6 × 800 = 4,800 so 4,800 ÷ 6 = 800
(e) 5 × 9,000 = 45,000 so 45,000 ÷ 5 = 9,000
(f) 8 × 7,000 = 56,000 so 56,000 ÷ 8 = 7,000

3. (a) 80
(b) 90
(c) 500
(d) 900
(e) 90
(f) 80
(g) 300
(h) 900
(i) 90
(j) 70
(k) 1000
(l) 800
(m) 70
(n) 60
(o) 600
(p) 600

4. (a) A three-digit number multiplied by a two-digit number equals a four or a five-digit number.
(b) A four-digit number multiplied by a two-digit number equals a five or a six-digit number.

Work It Out!

(a) €5,000
(b) (i) 28,000
(ii) €56,000
(c) €300
(d) 100
(e) 300

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1. (a) (i) 1,800
(ii) 2,000
(iii) 1,500
(iv) 600
(b) (i) 49,000
(ii) 9,000
(iii) 40,000
(iv) 20,000
(c) (i) 1,000
(ii) 1,800
(iii) 1,800
(iv) 1,000
(d) (i) 8,000
(ii) 25,000
(iii) 72,000
(iv) 56,000

2. (a) (i) 48
(ii) 63
(b) (i) 14
(ii) 28
(c) (i) 60
(ii) 90
(d) (i) 300
(ii) 450

3. (a) 226 ÷ 7 → 21T ÷ 7 = 3T = 30
(b) 346 ÷ 8 → 32T ÷ 8 = 4T = 40
(c) 395 ÷ 4 → 40T ÷ 4 = 10T = 100
(d) 390 ÷ 5 → 40T ÷ 5 = 8T = 80
(e) 441 ÷ 9 = 50
(f) 414 ÷ 6 = 70
(g) 453 ÷ 7 = 60
(h) 752 ÷ 8 = 90
(i) 272 ÷ 4 = 70
(j) 415 ÷ 5 = 80
(k) 562 ÷ 9 = 60
(l) 536 ÷ 6 = 90

Work It Out!

(i) €8,000
(ii) €9,200
(iii) €6,000
(iv) €6,600

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1. (a) 3,309
(b) 4,852
(c) 2,870
(d) 4,722

(e) 8,560
(f) 7,293
(g) 6,482
(h) 10,239
(i) 12,492
(j) 14,048
(k) 9,008
(l) 21,605

2. (a) 17,290
(b) 34,026
(c) 53,326
(d) 75,680
(e) 41,859
(f) 20,601
(g) 77,517
(h) 54,064
(i) 27,738
(j) 68,306
(k) 20,454
(l) 35,030

Work It Out!
(i) 4
(ii) €1,460

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3. (a) (i) $\frac{6}{10}$ or 0.6
(ii) $\frac{12}{10}$ or 1.2
(iii) $\frac{28}{100}$ or 0.28
(iv) $\frac{66}{100}$ or 0.66
(v) $\frac{28}{1000}$ or 0.028
(b) (i) $\frac{8}{10}$ or 0.8
(ii) $\frac{15}{10}$ or 1.5
(iii) $\frac{40}{100}$ or 0.4
(iv) $\frac{80}{100}$ or 0.8
(v) $\frac{35}{1000}$ or 0.035
(c) (i) 0.6
(ii) 2.4
(iii) 0.06
(iv) 0.36
(v) 0.036
(d) (i) 0.9
(ii) 2
(iii) 0.36
(iv) 0.48
(v) 0.056

4. (a) 7.14
(b) 4.52
(c) 4.96
(d) 2.06
(e) 54.6
(f) 42.96
(g) 216.05
(h) 46.26
(i) 9.408
(j) 9.723
(k) 14.048
(l) 14.492

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5. (a) 37.04
(b) 22.9
(c) 78.39
(d) 39.66
(e) 56.01
(f) 183.26
(g) 613.06
(h) 424.17
(i) 38.454
(j) 49.264
(k) 15.335
(l) 55.428

1. (a) 27,156
(b) 44,876
(c) 41,415
(d) 14,966
(e) 41,808
(f) 29,631
(g) 51,786
(h) 77,579
(i) 82,216
(j) 84,128
(k) 83,708
(l) 86,592

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2. (a) 29,376
(b) 24,542
(c) 59,472
(d) 36,998
(e) 23,424
(f) 53,415
(g) 77,256
(h) 57,275
(i) 79,798
(j) 91,390
(k) 60,494
(l) 80,343

3. (a) 29.16
(b) 82.16
(c) 63.15
(d) 100.66
(e) 419.68
(f) 580.21
(g) 811.46
(h) 677.49
(i) 30.786
(j) 34.668
(k) 79.072
(l) 96.798

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4. (a) 23.76
(b) 21.42
(c) 54.72
(d) 31.98
(e) 266.64
(f) 50.415
(g) 736.56
(h) 547.75
(i) 763.98
(j) 84.89
(k) 77.894
(l) 80.343

Work It Out!
(a) (i) €6,864
(ii) €8,102
(iii) €4,624
(iv) €5,292
(b) The laptops (€7,963) option is less expensive than the tablets option (€9,777).
(c) (i) €96.34
(ii) €85.80

1. (a) (i) $\frac{7}{10}$ or 0.7
(ii) $\frac{6}{10}$ or 0.6
(iii) $\frac{8}{100}$ or 0.08
(iv) $\frac{9}{100}$ or 0.09
(v) $\frac{7}{1000}$ or 0.007
(b) (i) $\frac{4}{10}$ or 0.4
(ii) $\frac{4}{10}$ or 0.4
(iii) $\frac{9}{100}$ or 0.09
(iv) $\frac{6}{100}$ or 0.06
(v) $\frac{5}{1000}$ or 0.005
(c) (i) 0.5
(ii) 0.6
(iii) 0.07
(iv) 0.09
(v) 0.008
(d) (i) 0.4
(ii) 0.5
(iii) 0.08
(iv) 0.05
(v) 0.011

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2. (a) €1.98
(b) €1.49
(c) €0.67
(d) €1.17
(e) €1.42

3. (a) €0.93
(b) €0.91
(c) €0.31
(d) €0.72
(e) €0.31
(f) €0.64
(g) €1.49
(h) €0.32

4. (a) 2.16
(b) 0.66
(c) 0.62
(d) 2.19
(e) 0.193
(f) 1.79
(g) 0.99
(h) 5.9
(i) 3.9
(j) 0.024

5. (a) 52 R 2
(b) 171 R4
(c) 216
(d) 32 R3
(e) 67 R1
(f) 65 R7
(g) 121
(h) 116 R4
(i) 62
(j) 86
(k) 36 R6
(l) 219
(m) 21 R6
(n) 149
(o) 97 R1

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1. **(a)** **(i)** 11,382
(ii) 49,322
(iii) 98,644
(b) 0.045 litres
(c) 5.448 kg
(d) 1.42 m
(e) **(i)** 2.6 km
(ii) 1.3 km
25.2 km
(f) **(i)** 1.43 kg
(ii) 0.455 kg
(g) €305

Work It Out!
(a) 5
(b) 2
(c) 1
(d) 9
(e) 5

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5. **(a)** C
(b) A
(c) **(i)** 8 cm
(ii) 4.5 cm
(iii) 8 cm
(iv) 14 cm

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6. **(a)** Circumference
(b) Centre point
(e) Diameter and radius
(f) An arc
1. **(a)** 4 cm^2
(b) 16 cm^2
(c) 12 cm^2
(d) 4 cm^2

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2. **(a)** 12 cm^2
(b) 32 cm^2
(c) 12 cm^2
(d) 32 cm^2
3. **(a)** 356 cm^2
(b) 132 cm^2
(c) 75 cm^2
(d) 184 cm^2
(e) 70 cm^2

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Work It Out!
(a) €2 diameter = 2.6 cm, €1 diameter = 2.3 cm, 50 c diameter = 2.4 cm
(b) 11.5 cm
(c) €2: 5 square units, €1: 4 square units, 50 c: 5 square units
(d) 37.2 cm

4. **(a)** A = 90°, B = 35°, C = 160° and D = 280°
(b) A: right angle, B: acute angle, C: obtuse angle, D: reflex angle
(c) A
5. Green sector = 50°, yellow sector = 90°, blue sector = 40°, orange sector = 120°, pink sector = 60°

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1. **(a)** €3.50
(b) €12.35
(c) €35
(d) €182
(e) €6.55

Work It Out!
(a) 35c
(b) 80c
(c) €95

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2. **(a)** 93c
(b) €2.63
(c) €5.21
(d) €18.63
(e) €86.34
(f) €5.49
(g) €36.28
(h) (a) 95c, (b) €2.65, (c) €5.20, (d) €18.65, (e) €86.35, (f) €5.50, (g) €36.30

Work It Out!
(a) €4.25
(b) **(i)** €7.41
(ii) €7.40
(c) **(i)** €126.48
(ii) €73.50
(d) €88
(e) €1.60
(f) €43.15

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3. **(a)** **(i)** €9.22
(ii) €40.80
(b) **(i)** €25.68
(ii) €15.10
(c) **(i)** €13.14
(ii) €36.85
(d) **(i)** €18.90
(ii) €17.95
(e) Karen; €2.85
(f) A bag of oranges, a loaf of bread and a bottle of water; €43.02 (If the shop rounded his bill to the nearest 5c then the answer would be €43.00.)
(g) €14.53
(h) €15.08
4. **(a)** **(i)** 56c
(ii) 81c

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(b) **(i)** 47c
(ii) €1.88
(iii) €1.04
(c) **(i)** €5.45
(ii) 5 boxes €27.25
(iii) €6.95
(iv) €15.00
(d) €6
(e) €5.98; 1.5 is half of 3
1. **(a)** €1.85
(b) 29c
(c) €112
(d) **(i)** €2.25
(ii) €2
(e) 2.9 m
(f) €36.40
(g) 2 kg 100 g
(h) €2.40
(i) €13.50

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2. Divide €2.60 by 2 and the answer by 2 (or divide €2.60 by 4)
Add €0.65 + €0.65 + €0.65 (or €0.65 × 3)
Or €2.60 – €0.65 (price of 4 apples – price of 1 apple)
3. **(a)** €120
(b) €15.50
(c) €101,500
(d) €5275
(e) €52
(f) €111.60
4. **(a)** €19.80
(b) €1140
(c) €17.55
(d) **(i)** €42.50
(ii) €85
(iii) €127.50
(e) €113
(f) €500

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1. **(a)** 10 apples for €4
(b) A can for €1
(c) A sandwich, a drink and a bag of crisps for €5
(d) 20 bars for €8
(e) 5 kg of carrots for €5
(f) Six-pack of golf balls
(g) 1 copy
(h) Six-pack of pots
(i) 40 tea bags

Work It Out!
(a) A bag of 5 apples; she saved 2c per apple (10c in all)

(b) 2.5 l bottle; she saved 2c per litre (5c in all)
(c) 2.5 kg bag; 20c per kg (50c in all)
(d) 1,500 kg bag; saved €5 per 250 kg (€30 in all)
(e) 5 pack of shampoo; she saved 15c per bottle (75c in all)
(f) 10 kg bag; she saved 30c per kg over the dearest option (€3 in all)
(g) The five-pack; she saved 8c per bottle over the dearest option (40c in all)
(h) The six-pack; she saved 15c per packet over the dearest option (90c in all)

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1. (a) €280
   (b) (i) Yes
   (ii) €209
   (c) (i) Lara
   (ii) €13.20
   (d) (i) €700
   (ii) €840
   (e) (i) Mai
   (ii) €23
2. (a) €48
   (b) €15
   (c) (i) Ger
   (ii) €6
   (d) €154
   (e) €420
   (f) €300

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2. (a) Using digits/ numbers or words
   (b) Numerator and denominator
   (c) Number of parts; into how many equal parts the whole has been split
   (d) Equivalent fractions

Work It Out!
(a) $\frac{1}{2}$
(b) (i) $\frac{3}{7}$
(ii) 70

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1. (a) (i) $\frac{3}{9}$ or $\frac{1}{3}$
   (ii) $\frac{6}{9}$ or $\frac{2}{3}$
   (b) (i) $\frac{6}{10}$ or $\frac{3}{5}$
   (ii) $\frac{4}{10}$ or $\frac{2}{5}$
   (c) (i) $\frac{7}{9}$
   (ii) $\frac{2}{9}$
   (d) (i) $\frac{8}{12}$ or $\frac{2}{3}$
   (ii) $\frac{4}{12}$ or $\frac{1}{3}$
   (e) (i) $\frac{3}{7}$
   (ii) $\frac{4}{7}$
   (f) (i) $\frac{2}{12}$ or $\frac{1}{6}$
   (ii) $\frac{10}{12}$ or $\frac{5}{6}$
   (g) (i) $\frac{2}{4}$ or $\frac{1}{2}$
   (ii) $\frac{2}{4}$ or $\frac{1}{2}$
   (h) (i) $\frac{3}{12}$ or $\frac{1}{4}$
   (ii) $\frac{9}{12}$ or $\frac{3}{4}$
   (i) (i) $\frac{8}{10}$ or $\frac{4}{5}$
   (ii) $\frac{2}{10}$ or $\frac{1}{5}$
   (j) (i) $\frac{6}{12}$ or $\frac{1}{2}$
   (ii) $\frac{6}{12}$ or $\frac{1}{2}$
2. See Question 1 above
3. (a) $\frac{7}{9}, \frac{2}{9}, \frac{3}{7}, \frac{4}{7}$
4. (a) $\frac{2}{3}$
   (b) $\frac{1}{6}$
   (c) $\frac{2}{3}$
   (d) $\frac{1}{4}$
   (e) $\frac{4}{5}$
   (f) $\frac{3}{4}$
   (g) $\frac{3}{4}$
   (h) $\frac{2}{5}$
   (i) $\frac{1}{3}$
   (j) $\frac{1}{3}$
   (k) $\frac{2}{3}$
   (l) $\frac{3}{5}$
   (m) $\frac{1}{3}$
   (n) $\frac{5}{6}$
   (o) $\frac{1}{4}$
   (p) $\frac{1}{5}$
   (q) $\frac{1}{2}$
   (r) $\frac{1}{2}$

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5. (a) $\frac{9}{12}$
   (b) $\frac{2}{10}$
   (c) $\frac{3}{5}$
   (d) $\frac{6}{9}$
   (e) $\frac{1}{4}$
   (f) $\frac{9}{9}$
   (g) $\frac{3}{12}$
   (h) $\frac{4}{12}$
   (i) $\frac{6}{12}$
   (j) $\frac{9}{12}$
   (k) $\frac{2}{4}$
   (l) $\frac{2}{8}$
   (m) $\frac{6}{8}$
   (n) $\frac{12}{12}$
   (o) $\frac{2}{12}$
   (p) $\frac{2}{3}$
   (q) $\frac{6}{12}$
   (r) $\frac{3}{9}$
   (s) $\frac{5}{10}$
   (t) $\frac{3}{9}$

Work It Out!
(a) $\frac{3}{4}$
(b) $\frac{2}{6}$ or $\frac{1}{3}$
(c) $\frac{6}{8}$ or $\frac{3}{4}$
(d) $\frac{3}{9}$ or $\frac{1}{3}$; $\frac{6}{9}$ or $\frac{2}{3}$

1. (a) (i) $\frac{1}{8}$
   (ii) $\frac{1}{2}$
   (iii) $\frac{3}{4}$
   (b) (i) $\frac{1}{6}$
   (ii) $\frac{1}{2}$
   (iii) $\frac{2}{3}$

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2. (a) (i) $\frac{1}{10}$
   (ii) $\frac{1}{2}$
   (iii) $\frac{2}{5}$
   (b) (i) $\frac{1}{9}$
   (ii) $\frac{1}{3}$
   (iii) $\frac{2}{3}$
   (c) (i) $\frac{1}{7}$
   (ii) $\frac{2}{7}$
   (iii) $\frac{5}{7}$
3. (a) $\frac{1}{12}$
   (b) $\frac{1}{3}$
   (c) $\frac{2}{3}$
   (d) $\frac{1}{3}$
   (e) $\frac{3}{4}$
   (f) $\frac{5}{12}$
4. (a) $\frac{4}{9}$
   (b) $\frac{4}{9}$
   (c) $\frac{5}{9}$
   (d) $\frac{1}{3}$
   (e) $\frac{7}{9}$
   (f) $\frac{4}{9}$
5. (a) $\frac{1}{3}$
   (b) $\frac{5}{12}$
   (c) $\frac{1}{6}$
   (d) $\frac{1}{2}$
   (e) $\frac{1}{12}$
   (f) $\frac{1}{2}$

Work It Out!
(a) $\frac{3}{4}$
(b) $\frac{3}{7}$
(c) $\frac{5}{8}$
(d) $\frac{2}{5}$
(e) $\frac{1}{3}$
(f) $\frac{3}{4}$

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1. A = $\frac{1}{4}$
   B = $\frac{1}{3}$
   C = $\frac{1}{2}$
   D = $\frac{3}{4}$
   E = $\frac{5}{6}$
   F = $1\frac{1}{12}$
   G = $1\frac{2}{3}$
   H = $1\frac{5}{6}$
   I = $1\frac{11}{12}$
   J = $\frac{4}{9}$
   K = $\frac{8}{9}$
   L = $1\frac{2}{9}$
   M = $1\frac{5}{9}$
   N = $1\frac{7}{9}$

2. (a) $\frac{5}{6}$ (b) $\frac{7}{10}$ (c) $\frac{1}{2}$ (d) $\frac{1}{3}$ (e) $\frac{5}{9}$ (f) $\frac{3}{4}$ (g) $\frac{5}{8}$ (h) $\frac{3}{8}$ (i) $\frac{12}{12}$ (j) $\frac{4}{4}$ (k) $\frac{2}{5}$ (l) $\frac{7}{8}$

3. (a) $\frac{1}{2}$ (b) $\frac{1}{10}$ (c) $\frac{1}{8}$ (d) $\frac{1}{12}$ (e) $\frac{1}{4}$ (f) $\frac{1}{12}$ (g) $\frac{3}{9}$ (h) $\frac{1}{6}$ (i) $\frac{3}{5}$ (j) $\frac{4}{9}$ (k) $\frac{2}{10}$ (l) $\frac{1}{3}$

4. (a) > (b) = (c) = (d) > (e) < (f) > (g) < (h) = (i) = (j) > (k) > (l) > (m) > (n) = (o) = (p) < (q) = (r) = (s) < (t) <

5. (a) $\frac{1}{4}, \frac{3}{9}, \frac{1}{2}$
(b) $\frac{2}{10}, \frac{1}{3}, \frac{2}{5}$
(c) $\frac{4}{9}, \frac{1}{2}, \frac{8}{8}$
(d) $\frac{1}{6}, \frac{5}{8}, \frac{3}{4}$
(e) $\frac{4}{9}, \frac{4}{6}, \frac{4}{4}$
(f) $\frac{3}{5}, \frac{7}{8}, \frac{12}{12}$
(g) $\frac{4}{12}, \frac{4}{10}, \frac{4}{8}$
(h) $\frac{1}{4}, \frac{7}{9}, 1$
(i) $\frac{2}{10}, \frac{5}{12}, \frac{3}{4}$
(j) $\frac{1}{4}, \frac{2}{5}, \frac{2}{2}$
(k) $\frac{7}{12}, \frac{3}{4}, \frac{9}{10}$
(l) $\frac{1}{3}, \frac{9}{12}, \frac{7}{8}$

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Work It Out!

(a) Frank
(d) Dan
(e) Trick question: Can't tell who has the greater number since we don't know what number of books they each have, but they both have the same fraction of non-fiction books
(f) Tim had the ham pizza, Jan had the veggie pizza and Mia had the cheese pizza

1. (a) 14 (b) 21 (c) 50 (d) 192 (e) 69 (f) 68 (g) 84 (h) 62 (i) 140 (j) 255 (k) 95 (l) 99

2. (a) 312 (b) 492 (c) 96 (d) 360 (e) 375 (f) 321 (g) 729 (h) 235 (i) 378 (j) 576 (k) 639 (l) 567

3. (b) The answers to Q1 are all smaller than the starting number and the answers to Q2 are all bigger than the starting number.
(c) Multiplication and/or division

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Work It Out!

(a) 18; 81
(b) 28
(c) (i) Philip
(ii) Mike
(d) 320
(e) 810 litres
(f) €301
(g) (i) €60
(ii) €618
(iii) €580
(iv) €447
(v) €992
(h) (i) 50 cm
(ii) 25 cm
(iii) 10 cm
(iv) 20 cm
(v) 12.5 cm
(vi) $33\frac{1}{2}$ cm

1. (a) False. Fractions less than 1 cannot.
(b) False. Fractions less than 1 cannot.
(c) True

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2. (a) $1\frac{3}{4}, \frac{7}{4}$
(b) $2\frac{2}{5}, \frac{12}{5}$
(c) $2\frac{4}{9}, \frac{22}{9}$
(d) $2\frac{5}{10}, \frac{25}{10}$
(e) $1\frac{5}{6}, \frac{11}{6}$
(f) $2\frac{1}{2}, \frac{5}{2}$
(g) $2\frac{5}{8}, \frac{21}{8}$
(h) $1\frac{2}{3}, \frac{5}{3}$

3. (a) $\frac{5}{4}$ (b) $\frac{9}{8}$ (c) $\frac{7}{2}$ (d) $\frac{11}{6}$ (e) $\frac{8}{3}$ (f) $\frac{9}{5}$ (g) $\frac{37}{10}$ (h) $\frac{25}{9}$

4. (a) $1\frac{7}{8}$ (b) $2\frac{1}{4}$ (c) $4\frac{1}{2}$ (d) $3\frac{1}{3}$ (e) $2\frac{2}{5}$ (f) $2\frac{1}{3}$ (g) $1\frac{8}{9}$ (h) $2\frac{1}{12}$

5. (a) The numerator is greater than the denominator
(b) Multiply the whole number by the number of parts in a whole (i.e. denominator) and add on any other fractions (i.e. the numerator). To convert an improper fraction to a mixed number, divide the numerator by the denominator and add on any remainders

6. (a) $\frac{19}{4}$ (b) $\frac{29}{8}$ (c) $\frac{11}{2}$ (d) $\frac{25}{6}$ (e) $\frac{17}{3}$ (f) $\frac{22}{5}$ (g) $\frac{53}{10}$ (h) $\frac{44}{9}$

7. (a) $6\frac{1}{2}$ (b) $6\frac{1}{3}$ (c) $5\frac{3}{5}$ (d) $4\frac{5}{6}$ (e) $4\frac{3}{8}$ (f) $5\frac{1}{2}$ (g) $3\frac{2}{9}$ (h) $4\frac{1}{6}$

8. (a) $3\frac{3}{4} = \frac{15}{4}$
(b) $4\frac{1}{2} = \frac{9}{2}$
(c) $6\frac{1}{3} = \frac{19}{3}$
(d) $6\frac{5}{6} = \frac{41}{6}$
(e) $7\frac{2}{3} = \frac{23}{3}$

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Work It Out!

(a) $2\frac{4}{10}$ or $2\frac{2}{5} = \frac{24}{10}$ or $\frac{12}{5}$
(b) 16
(c) 28 quarters
(d) (i) 48 eighths
(ii) 29 eighths or $3\frac{5}{8}$

1. (a) $\frac{3}{4}$ (b) $\frac{3}{8}$ (c) $\frac{5}{8}$ (d) $1\frac{1}{4}$ (e) $\frac{7}{8}$ (f) $\frac{7}{8}$ (g) $1\frac{1}{8}$ (h) $1\frac{1}{8}$ (i) $1\frac{3}{8}$ (j) $1\frac{5}{8}$ (k) $1\frac{3}{4}$ (l) $1\frac{5}{8}$ (m) $3\frac{1}{8}$ (n) $3\frac{1}{8}$ (o) $4\frac{3}{8}$

2. (a) $\frac{4}{5}$ (b) $\frac{7}{10}$ (c) $1\frac{2}{5}$ (d) $1\frac{3}{5}$ (e) $1\frac{1}{10}$ (f) $1\frac{7}{10}$ (g) $2\frac{1}{5}$ (h) $2\frac{1}{5}$ (i) $2\frac{4}{5}$ (j) $4\frac{7}{10}$

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3. (a) $\frac{4}{6}$ (b) $\frac{7}{9}$ (c) $1\frac{1}{3}$ (d) $1\frac{2}{3}$ (e) $1\frac{2}{3}$ (f) $1\frac{1}{4}$ (g) $\frac{1}{2}$ (h) $\frac{3}{4}$ (i) $1\frac{1}{9}$ (j) $1\frac{1}{4}$ (k) $2\frac{1}{9}$ (l) $3\frac{1}{6}$ (m) $4\frac{1}{4}$ (n) $3\frac{1}{3}$ (o) $3\frac{1}{12}$

Work It Out!

(a) $\frac{7}{8}$ (b) $\frac{5}{6}$ (c) $\frac{7}{9}$ (d) $2\frac{7}{8}$ (e) $6\frac{1}{4}$ kg

1. (a) $\frac{1}{4}$ (b) $\frac{1}{8}$ (c) $\frac{3}{8}$ (d) $\frac{1}{4}$ (e) $\frac{5}{8}$ (f) $\frac{1}{8}$ (g) $\frac{1}{8}$ (h) $\frac{3}{8}$ (i) $\frac{3}{8}$ (j) $1\frac{1}{8}$ (k) $1\frac{1}{4}$ (l) $1\frac{3}{8}$ (m) $\frac{7}{8}$ (n) $\frac{7}{8}$ (o) $1\frac{3}{8}$

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2. (a) $\frac{2}{5}$ (b) $\frac{3}{10}$ (c) $\frac{1}{5}$ (d) $\frac{1}{5}$ (e) $\frac{1}{10}$ (f) $\frac{1}{10}$ (g) $\frac{2}{5}$ (h) $\frac{7}{10}$ (i) $\frac{9}{10}$ (j) $1\frac{1}{10}$

3. (a) $\frac{1}{3}$ (b) $\frac{1}{9}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$ (e) $\frac{2}{3}$ (f) $\frac{5}{12}$ (g) $\frac{1}{2}$ (h) $\frac{7}{12}$ (i) $\frac{2}{9}$ (j) $\frac{5}{12}$ (k) $\frac{1}{2}$ (l) $\frac{5}{9}$ (m) $\frac{3}{4}$ (n) $\frac{2}{3}$ (o) $1\frac{2}{3}$

Work It Out!

1. A. $3\frac{4}{5}$ B. $3\frac{2}{3}$ C. $8\frac{3}{8}$ D. $3\frac{1}{2}$ E. $5\frac{4}{9}$
2. $\frac{3}{8}$
3. (a) $\frac{7}{10}$ (b) $\frac{3}{10}$ (c) (i) 120 (ii) 90 (iii) 90
4. (a) $3\frac{1}{4}$ (b) $1\frac{5}{6}$ (c) $1\frac{1}{6}$ (d) (i) 21 (ii) 17 (iii) 14 (iv) 52

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1. (a) $\frac{1}{2} \times 4 = 2$ (b) $\frac{5}{8} \times 2 = 1\frac{1}{4}$ (c) $\frac{3}{4} \times 3 = 2\frac{1}{4}$ (d) $\frac{2}{3} \times 4 = 2\frac{2}{3}$ (e) $\frac{4}{9} \times 3 = 1\frac{1}{3}$ (f) $\frac{2}{5} \times 2 = \frac{4}{5}$ (g) $\frac{5}{6} \times 2 = 1\frac{2}{3}$
2. (a) $\frac{1}{8} \times 5 = \frac{5}{8}$ (b) $\frac{1}{9} \times 3 = \frac{3}{9}$ (c) $\frac{1}{2} \times 4 = 2$ (d) $\frac{1}{4} \times 5 = 1\frac{1}{4}$ (e) $\frac{1}{6} \times 4 = \frac{4}{6} = \frac{2}{3}$ (f) $5 \times \frac{1}{5} = 1$ (g) $\frac{1}{3} \times 4 = 1\frac{1}{3}$ (h) $\frac{3}{4} \times 4 = 3$ (i) $\frac{3}{8} \times 6 = 2\frac{2}{8} = 2\frac{1}{4}$
3. (a) $3\frac{1}{2}$ (b) $1\frac{1}{4}$ (c) 4 (d) $1\frac{1}{8}$ (e) $1\frac{1}{2}$ (f) $1\frac{1}{2}$ (g) $1\frac{7}{8}$ (h) $3\frac{1}{2}$ (i) 3 (j) $1\frac{7}{8}$ (k) $2\frac{1}{2}$ (l) $4\frac{3}{8}$

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4. (a) $\frac{3}{5}$ (b) $\frac{2}{5}$ (c) $\frac{5}{6}$ (d) $\frac{4}{9}$ (e) 2 (f) $\frac{5}{7}$ (g) $\frac{6}{11}$ (h) $\frac{9}{12}$ (i) $1\frac{3}{5}$ (j) $1\frac{1}{2}$ (k) $2\frac{1}{3}$ (l) $1\frac{7}{9}$ (m) $1\frac{1}{4}$ (n) $1\frac{5}{7}$ (o) $1\frac{2}{3}$ (p) $4\frac{2}{3}$
5. (a) 1 (b) 2 (c) 1 (d) 2 (e) 5 (f) 1 (g) 2 (h) 2 (i) 3 (j) 3 (k) $3\frac{1}{2}$ (l) $2\frac{1}{2}$ (m) 6 (n) 12 (o) 4 (p) 4

Work It Out!

(a) (i) $4\frac{1}{2}$ (ii) $2\frac{1}{2}$
(b) (i) $2\frac{1}{2}$ (ii) $\frac{1}{2}$
(c) (i) $3\frac{1}{3}$ (ii) $\frac{2}{3}$

6. (a) False; improper fractions show numbers greater than one
(b) False; improper fractions and whole numbers in fraction form
(c) True
(d) False
(e) True
(f) True
(g) False; $\frac{2}{3} \times 4 = \frac{8}{3}$ or $2\frac{2}{3}$

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1. (a) (i) B, C, D and E (ii) A, F and G
(b) A: scalene triangular prism
B: cube
C: cuboid
D: regular pentagonal prism
E: regular hexagonal prism
F: irregular quadrilateral prism
G: irregular pentagonal prism

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1. (a) 4 faces (b) 4 vertices (c) 1 apex (d) 6 edges

2. A: tetrahedron (triangular base)
B: square pyramid
C: rectangular pyramid
D: pentagonal pyramid
E: hexagonal pyramid
F: octagonal pyramid

3. 16, 4

1. **(a)** **(i)** A, C, E and F
(ii) B and D
(b) A: **(i)** 6 faces
(ii) 12 edges
(iii) 8 vertices
(iv) 0 apexes
C: **(i)** 5 faces
(ii) 9 edges
(iii) 6 vertices
(iv) 0 apexes
E: **(i)** 6 faces
(ii) 12 edges
(iii) 8 vertices
(iv) 0 apexes
F: **(i)** 4 faces
(ii) 6 edges
(iii) 4 vertices
(iv) 1 apex

2. **(a)** Sphere (but a football may be made from pentagonal 2-D shapes stitched together.)
(b) Pentagons and hexagons

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1. **(a)** A: 6, B: 5, C: 7, D: 3, E: 5
(b) A: 12, B: 8, C: 15, D: 2, E: 9
(c) A: 8, B: 5, C: 10, D: 0, E: 6
(d) A: square
B: square and triangle
C: pentagon and square
D: rectangle and circle
E: rectangle and triangle
(e) A: cube
B: square pyramid
C: pentagonal prism
D: cylinder
E: triangular prism

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5. **(b)** Cylinder and cuboid; triangular prism and cuboid; cylinder and cone (top removed); cuboids, cylinder and triangular prism; sphere and cone (top removed)

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1. **(a)** A: irregular prism
B: cube
C: cylinder
D: square-based pyramid
E: irregular prism
F: cuboid
G: sphere
(b) **(i)** Square-based pyramid
(ii) 5
(iii) 5
(iv) 8
(c) Square-based pyramid

2. **(a)** 186
(b) 171

3. **(a)** 5 m
(b) **(ii)** 10 cm
(c) 864

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4. **(a)** 3
(b) $\frac{3}{12}, \frac{1}{4}$
(c) $\frac{1}{2}$
(d) $\frac{5}{6}$
(e) 3
(f) 10
(g) 12

5. **(a)** €5.62
(b) $1\frac{5}{8}$ kg
(c) $6\frac{5}{12}$ kg
(d) 10.85 kg
(e) $\frac{1}{8}$
(f) 49c or €0.49
(g) €1.26
(h) €59.43
(i) €139.95
(j) **(i)** The daily rate
(ii) €2.10
(k) 94c or €0.94

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1. **(a)** 150
(b) 75
(c) 300
(d) 600
(e) 230
(f) 115
(g) 460
(h) 920
(i) 180
(j) 90
(k) 360
(l) 720
(m) 260
(n) 130
(o) 520
(p) 1,040

2. **(a)** 30
(b) 20
(c) 20
(d) 30
(e) 40
(f) 20
(g) 40
(h) 30
(i) 30
(j) 40

3. **(a)** 20
(b) 40
(c) 40
(d) 30
(e) 20
(f) 30
(g) 50
(h) 20
(i) 20
(j) 50
(k) 50
(l) 40
(m) 20
(n) 70
(o) 60
(p) 30

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Work It Out!
(a) 30
(b) €40
(c) €50
(d) 30
(e) **(i)** 18
(ii) 9
(iii) 30

1. **(a)** 10 × 17 = 170, 20 × 17 = 340, estimate = 21
(b) 10 × 13 = 130, 20 × 13 = 260, estimate = 21
(c) 10 × 15 = 150, 20 × 15 = 300, 40 × 15 = 600, estimate = 42
(d) 10 × 19 = 190, 20 × 19 = 380, estimate = 21
(e) 10 × 31 = 310, 20 × 31 = 620, estimate = 22 or 23
(f) 10 × 23 = 230, 20 × 23 = 460, estimate = 19 or 18
(g) 10 × 42 = 420, 20 × 42 = 840, estimate = 19 or 18
(h) 10 × 57 = 570, estimate = 11 or 12

(i) 10 × 36 = 360, 20 × 36 = 720, estimate = 17 or 18
(j) 10 × 29 = 290, 20 × 29 = 580, estimate = 19
(k) 10 × 41 = 410, 20 × 41 = 820, estimate = 22 or 23
(l) 10 × 26 = 260, 20 × 26 = 520, estimate = 16 or 17

Work It Out!
(i) 12
(ii) 18
(iii) 22

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2. (a) 9
(b) 8
(c) 8 or 7
(d) 9
(e) 5
(f) 6
(g) 6
(h) 9
(i) 5
(j) 8
(k) 6
(l) 7
3. (a) 3
(b) 9
(c) 6
(d) 8
(e) 8
(f) 11
(g) 9
(h) 6
(i) 3
(j) 4
(k) 24
(l) 30
4. (a) 2.9
(b) 9
(c) 6.2
(d) 7.8
(e) 7.9
(f) 10.9
(g) 9.6
(h) 5.5
(i) 3.2
(j) 4.3
(k) 24.2
(l) 29.3

Work It Out!
(a) 20 km
(b) 50
(c) 6

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1. (a) 13
(b) 11
(c) 12
(d) 12
(e) 14
(f) 13
(g) 11
(h) 12
(i) 13
(j) 21
(k) 22
(l) 21
2. Multiplying the quotient (answer) by the divisor should give the dividend.
3. (a) 14 R5
(b) 11 R5
(c) 12 R6
(d) 13 R3
(e) 13 R6
(f) 22 R6
(g) 21 R7
(h) 21 R5
(i) 13 R5
(j) 12 R7
(k) 12 R4
(l) 11 R6
4. The quotient (answer) multiplied by the divisor, plus the remainder, should equal the dividend.

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Work It Out!
(a) €22
(b) 7 m
(c) 18 ml

1. (a) 3
(b) 3
(c) 5
(d) 4
(e) 4
(f) 3
(g) 5
(h) 6
2. (a) 6
(b) 9
(c) 5
(d) 8
(e) 7
(f) 11
(g) 12
(h) 13
4. (a) 17 R1
(b) 16 R8
(c) 7 R6
(d) 13 R1
(e) 7 R14
(f) 8 R7
(g) 11 R74
(h) 11 R8
(i) 6 R10
(j) 14 R15
(k) 12 R12
(l) 9 R19

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Work It Out!
(a) 13
(b) 11
(c) 19
(d) 7
(e) 14

1. (a) 16 R14
(b) 25
(c) 50 R6
(d) 13 R5
(e) 25 R21
(f) 13 R49
(g) 44 R2
(h) 19 R19
(i) 40 R3
(j) 18
(k) 7 R33
(l) 8
(m) 7
(n) 5 R63
(o) 7
(p) 8

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Work It Out!
(a) (i) 27
(ii) 14
(iii) 9
(b) 6 or 18, not 12
(c) 18 eggs
(d) Three trays of 12 eggs for €5

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1. (a) 14
(b) 11
(c) 12
(d) 18
(e) 11 R5
(f) 12 R3
(g) 15 R7
(h) 15 R12
(i) 21 R10
(j) 25 R14
(k) 18 R10
(l) 19 R11
(m) 31 R10
(n) 34 R9
(o) 33 R8
(p) 39 R15
2. (a) 10 R5
(b) 10 R19
(c) 10 R24
(d) 10 R6
(e) 20 R11
(f) 20 R13
(g) 20 R19
(h) 30 R23
(i) 30 R16
(j) 30 R15
3. (a) 9 R15
(b) 7 R13
(c) 9 R5
(d) 8 R4
(e) 9 R11
(f) 8 R22
(g) 6 R12
(h) 6 R17
(i) 7 R13
(j) 8 R39
4. (a) Only have to subtract once on Questions 2 and 3

(b) Quotients are all multiples of 10, easy to estimate
(c) Quotients are less than 10, easy to estimate
(d) Not for Question 2 as they were always a bit more than 10 times, 20 times etc., not always necessary for Question 3 either as obvious they were a little less than 10 times e.g. 9 times

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Work It Out!
(a) 34
(b) 8 full days
(c) **(i)** 16
(ii) 6
(iii) Have teams of 10 or 23 (probably too big) or (10 teams of 14) plus (6 teams of 15)
(d) 11
(e) 21

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1. **(a)** €0.43
(b) €0.42
(c) €0.15
(d) €0.40
(e) €0.28
(f) €0.80
(g) €0.52
(h) €0.20
(i) €0.19
2. **(a)** 0.45 m
(b) 0.3 m
(c) 0.24 m
(d) 0.2 m
(e) 0.15 m
(f) 0.12
3. 0.32 m
4. **(a)** Use same digits, but different place value
(b) Quotient uses the same digits but is ten times smaller each time.
(c) We can do the calculation as if the dividend was a whole number and then place the decimal point in the quotient (answer).
5. **(a)** €0.78
(b) €0.34
(c) 0.31 m
(d) 0.19 m
(e) 0.057 km
(f) 0.037 kg
(g) 0.016 litres
(h) 0.035 km
(i) 5.2
(j) 4.1
(k) 0.38
(l) 0.17

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6. **(a)** 13
(b) 14
(c) 45
(d) 16.5
(e) 6.25

Work It Out!
1. **(a)** A = 0.14
B = 0.23
C = 4.37
D = 3.57
E = 0.2
F = 0.22
(b) **(i)** Saturday
(ii) Monday
(c) **(i)** Wednesday
(ii) Tuesday
(d) 2.75 km
(e) 30.55 km
(f) **(i)** 161 mins
(ii) 2 hrs 41 mins
(g) 23 mins
2. A = 18
B = 6
C = 460
D = 92
E = 33
F = 15
G = 45
H = 2.70

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1. **(a)** Balance the number between the 3 children
(c) 6 in each pile
2. **(a)** 8
(b) 13
(c) 24
(d) €2.50
(e) 16
(f) 5

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3. **(a)** He will have to take some cars from the box with 15 in it and put them in the box with 8 in it and then balance the cars between the three boxes.
(c) 12
4. **(a)** 8
(b) 14
(c) 22
(d) 6
(e) 5
5. **(a)** Some people spend more time than that, others less, but on average they spend 41 minutes.
(b) Some people have a snack more often and some less often but on average they snack 2.55 times each day.
(c) Some will donate more and some less but on average they donate €130 each year.

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6. **(a)** 16
(b) 40
(c) 15
(d) 30
(e) €1.50
(f) 2.4 m
(g) €2
(h) 230 kg
7. Not very well in some cases but very well in others. Other strategy: if a number is repeated choose that number or survey the numbers and choose the number that appears to be the best choice as the average.
8. **(a)** 65c
(b) €1039
(c) 6.5 hrs or 6 hrs 30 mins
(d) 134 cm
(e) 221 g
9. **(a)** 495 cm
(b) No
(c) Any combination that adds to 495 cm
(d) Yes

Work It Out!
(a) €22.35
(b) 2,280 g or 2.28 kg
(c) 53.6 km
(d) 3 hrs 16 mins or 196 mins
(e) €1462

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10. (a) 969
(b) 994
(c) 914
(d) They only worked a half day
(e) 1153
(f) 1127
(g) €60.78
(h) €62.99
(i) €61.23
(j) €354.84
(k) Lily
(l) Pat
(m) Pat
(n) Lily
(o) 3228

1. (a) 10
(b) 20
(c) 70
(d) 80
(e) 230

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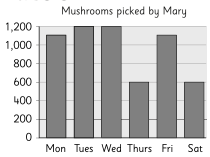
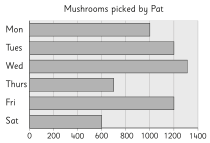
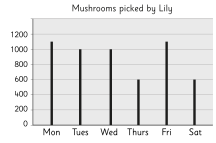
2. (a) 100
(b) 1:200
(c)



3. (a) 100
(b) 1:200
(c)



4. (a) 100
(b) 1:200
(c)



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1. (a) 22
(b) 43
(c) 32.5
(d) Saturday, Week 2
(e) 130
(f) €331.50

2. (a)

	Jill	Hilary
Monday	8 km	12 km
Tuesday	15 km	10 km
Thursday	18 km	16 km
Friday	5 km	7 km
Saturday	12 km	10 km
Sunday	10 km	12 km

(b) 11.33 km
(c) 11.17 km
(d) Thursday
(e) Friday
(f) 68 km
(g) 135 km
(h) 70 km

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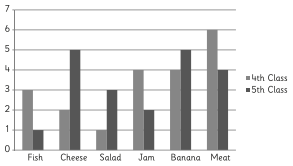
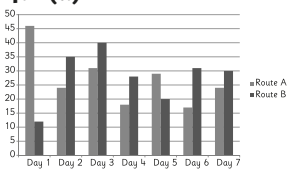
3. (a)



(b) 20
(c) 20
(d) Meat
(e) Banana or cheese
(f) Salad
(g) Fish
(h) 5
(i) 3
(j) 12

4. (a)



(b) 189
(c) 196
(d) Route B
(e) 27
(f) 28
(g) €2,268 (total collected for the week)
(h) €1,911
(i) The information is inconclusive. Route A is taking more money but Route B is carrying more passengers. Another survey would be required.

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1. (a) (i) €20
(ii) €30
(iii) €40
(iv) €60
(b) Meat: €40
(a) Circle
(b) 360°
(c) Use a protractor
(d) 3°
(e) €20, 60°
(f) €40, 120°
(g) €30, 90°
(h) €30, 90°

2. (a) (i) 10°
(ii) 60°
(iii) 90°
(iv) 120°
(v) 30°
(vi) 60°
(b) (i) 90°
(ii) 30°
(iii) 120°

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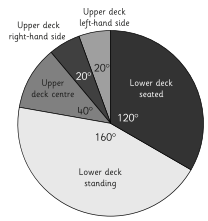
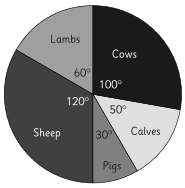
3. (a) 2°
(b)

	Number	degrees
Lower deck seated	60	120°
Lower deck standing	80	160°
Upper deck centre	20	40°
Upper deck right-hand side	10	20°
Upper deck left-hand side	10	20°

(c)



4.



5. (a) 12
(b) 6
(c) 5
(d) Milk
(e) Orange juice
(f) 15
(g) 60°
(h) 10°
(i) 90°
(j) $\frac{1}{3}$
(k) $\frac{1}{9}$
(l) $\frac{1}{4}$

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1. (a) 0.461 = 0.4 + 0.06 + 0.001
(b) 0.135 = 0.1 + 0.03 + 0.005
(c) 0.349 = 0.3 + 0.04 + 0.009
(d) 0.737 = 0.7 + 0.03 + 0.007
(e) 0.213 = 0.2 + 0.01 + 0.003
(f) 4.031 = 4 + 0.03 + 0.001
(g) 7.096 = 7 + 0.09 + 0.006
(h) 17.002 = 10 + 7 + 0.002
(i) 37.38 = 30 + 7 + 0.3 + 0.08
(j) 84.7 = 80 + 4 + 0.7

2. (a) $\frac{435}{1000}$
(b) $\frac{918}{1000}$
(c) $\frac{548}{1000}$
(d) $\frac{137}{1000}$
(e) $2\frac{377}{1000}$
(f) $4\frac{38}{1000}$
(g) $8\frac{45}{1000}$
(h) $15\frac{7}{1000}$
(i) $25\frac{450}{1000}$ or $25\frac{45}{100}$
(j) $64\frac{8}{10}$ or $64\frac{800}{1000}$

3. **(a)** $\frac{1}{10}+\frac{3}{100}+\frac{9}{1000}$
(b) $\frac{3}{10}+\frac{7}{100}+\frac{4}{1000}$
(c) $\frac{4}{10}+\frac{8}{100}+\frac{7}{1000}$
(d) $7+\frac{8}{10}+\frac{5}{1000}$
(e) $5+\frac{4}{10}+\frac{7}{100}+\frac{3}{1000}$
(f) $2+\frac{6}{10}+\frac{7}{1000}$
(g) $9+\frac{1}{100}+\frac{3}{1000}$
(h) $90+4+\frac{2}{1000}$
(i) $40+8+\frac{9}{100}+\frac{4}{1000}$
(j) $50+6+\frac{5}{10}+\frac{8}{100}$

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4. **(a)** 81.003
(b) 18.009
(c) 2.461
(d) 3.943
(e) 1.346
(f) 6.297
(g) 14.073
(h) 2.471
(i) 9.617
(j) 35.768
(k) 1,080.49
(l) 10.867
(m) 62.905
(n) 50.018
(o) 3.9
(p) 7.678
(q) 40.041
(r) 8.04
(s) 16.007
(t) 8.208
(u) 8.41
(v) 75.036
(w) 9.501

Work It Out!

(a) $\frac{479}{1000}$
(b) $\frac{246}{1000}$
(c) $\frac{6}{10}$
(d) $\frac{23}{100}$
(e) $\frac{3}{4}$
(f) $\frac{96}{1000}$

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2. **(a)** $\frac{1}{2}$ **(e)** $\frac{1}{4}$
(b) $\frac{1}{3}$ **(f)** $\frac{3}{5}$
(c) $\frac{1}{12}$ **(g)** $\frac{3}{8}$
(d) $\frac{1}{4}$ **(h)** $\frac{2}{9}$

3. **(a)** $\frac{1}{12}$ **(e)** $\frac{10}{40}$
(b) $\frac{9}{10}$ **(f)** $\frac{30}{40}$
(c) $\frac{8}{50}$ **(g)** $\frac{17}{20}$
(d) $\frac{15}{100}$ **(h)** $\frac{24}{40}$

Work It Out!

(a) Red: $\frac{6}{24}, \frac{3}{12}, \frac{1}{4}$
Blue: $\frac{8}{24}, \frac{4}{12}, \frac{1}{3}$
(b) **(i)** Green $\frac{5}{6}$; Red $\frac{7}{8}$; Blue $\frac{3}{5}$; Yellow $\frac{4}{6}\left(\frac{2}{3}\right)$
(ii) Red
(iii) Blue

1. **(a)** 0.75 **(i)** 0.08
(b) 0.2 **(j)** 0.64
(c) 0.3 **(k)** 0.06
(d) 0.8 **(l)** 0.42
(e) 0.07 **(m)** 0.125
(f) 0.23 **(n)** 0.875
(g) 0.35 **(o)** 0.333
(h) 0.55 **(p)** 0.166

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2. **(a)** $\frac{1}{4}$ **(i)** $\frac{17}{20}$
(b) $\frac{2}{5}$ **(j)** $\frac{1}{25}$
(c) $\frac{1}{10}$ **(k)** $\frac{4}{25}$
(d) $\frac{4}{5}$ **(l)** $\frac{12}{25}$
(e) $\frac{9}{100}$ **(m)** $\frac{7}{50}$
(f) $\frac{41}{100}$ **(n)** $\frac{2}{25}$
(g) $\frac{1}{20}$ **(o)** $\frac{37}{50}$
(h) $\frac{13}{20}$ **(p)** $\frac{18}{25}$

3. **(a)** $1.75 = 1\frac{3}{4}$
$0.3333 = \frac{1}{3}$
$1.6 = 1\frac{3}{5}$
$0.375 = \frac{3}{8}$
(b) $0.16666 = \frac{1}{6}$
$0.6666 = \frac{2}{3}$
$0.08 = \frac{2}{25}$
$0.625 = \frac{5}{8}$

4. **(a)** $\frac{1}{2}$, 0.5
(b) $\frac{3}{4}$, 0.75
(c) $\frac{9}{10}$, 0.9
(d) $\frac{1}{4}$, 0.25
(e) $\frac{1}{5}$, 0.2
(f) $\frac{4}{5}$, 0.8
(g) $\frac{7}{20}$, 0.35
(h) $\frac{19}{20}$, 0.95
(i) $\frac{3}{8}$, 0.375
(j) $\frac{7}{8}$, 0.875
(k) $\frac{3}{8}$, 0.375
(l) $\frac{1}{3}$, 0.333

Work It Out!

1. **(a)** $\frac{7}{20}$, 0.35
(b) $\frac{6}{25}$, 0.24
(c) $\frac{3}{5}$, 0.6
(d) $\frac{7}{10}$, 0.7

2. **(a)** English: $\frac{3}{4}$, 0.75
Irish: $\frac{13}{20}$, 0.65
Maths: $\frac{4}{5}$, 0.8
History: $\frac{9}{10}$, 0.9
Geography: $\frac{7}{8}$, 0.875
Science: $\frac{17}{20}$, 0.85
(b) **(i)** History
(ii) Irish

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1. **(a)** **(i)** $\frac{9}{100}$, 9%
(ii) $\frac{91}{100}$, 91%
(b) **(i)** $\frac{17}{100}$, 17%
(ii) $\frac{83}{100}$, 83%
(c) **(i)** $\frac{33}{100}$, 33%
(ii) $\frac{67}{100}$, 67%
(d) **(i)** $\frac{23}{50}$, 46%
(ii) $\frac{27}{100}$, 54%
(e) **(i)** $\frac{3}{10}$, 30%
(ii) $\frac{7}{10}$, 70%
(f) **(i)** $\frac{4}{5}$, 80%
(ii) $\frac{1}{5}$, 20%
(g) **(i)** $\frac{2}{5}$, 40%
(ii) $\frac{3}{5}$, 60%
(h) **(i)** $\frac{7}{10}$, 70%
(ii) $\frac{3}{10}$, 30%
(i) **(i)** $\frac{3}{5}$, 60%
(ii) $\frac{2}{5}$, 40%
(j) **(i)** $\frac{1}{2}$, 50%
(ii) $\frac{1}{2}$, 50%
(k) **(i)** $\frac{3}{4}$, 75%
(ii) $\frac{1}{4}$, 25%
(l) **(i)** $\frac{9}{10}$, 90%
(ii) $\frac{1}{10}$, 10%
(m) **(i)** 1, 100%
(ii) 0, 0%
(n) **(i)** $\frac{1}{4}$, 25%
(ii) $\frac{3}{4}$, 75%

2. **(i)** m, 100%
(ii) a, 91%

3. **(i)** a, 9%
(ii) m, 0%

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Work It Out!

(a) 70%
(b) 85%
(c) **(i)** 79%
(ii) 21%
(d) **(i)** 40%
(ii) 60%
(e) **(i)** 30%
(ii) 70%

1. **(a)** 0.97
(b) 0.43
(c) 0.28
(d) 0.56
(e) 0.1
(f) 0.6
(g) 0.02
(h) 0.09

(i) 0.089
(j) 1.1
(k) 0.055
(l) 2

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2. (a) 4% (b) 9% (c) 16% (d) 48% (e) 60% (f) 90% (g) 20% (h) 30% (i) 150% (j) 12.5% (k) 220% (l) 7.6%

Work It Out!
(a) €0.10
(b) €0.70
(c) €0.50
(d) €0.25
(e) €0.93
(f) €0.34
(g) €0.01
(h) €0.05
(i) €0.07
(j) €2
(k) €1.50
(l) €1.20

3. (a) (i) €40
(ii) 60%
(iii) €60
(b) 30 pupils
4. (a) 20%
(b) (i) 20
(ii) 40
(iii) 10

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1. (a) 23% (b) 85% (c) 30% (d) 40% (e) 80% (f) 15% (g) 55% (h) 95% (i) 26% (j) 40% (k) 88% (l) 80% (m) 200% (n) 120% (o) 37.5% (p) 75% (q) 50% (r) $66\frac{2}{3}$%

2. (a) $\frac{1}{4}$ (b) $\frac{21}{100}$ (c) $\frac{7}{10}$ (d) $\frac{2}{5}$ (e) $\frac{1}{20}$ (f) $\frac{3}{20}$ (g) $\frac{13}{20}$ (h) $\frac{11}{20}$ (i) $\frac{3}{50}$ (j) $\frac{6}{25}$ (k) $\frac{19}{50}$ (l) $\frac{11}{25}$ (m) $1\frac{1}{4}$ (n) $\frac{24}{25}$ (o) $\frac{47}{50}$ (p) $1\frac{1}{2}$ (q) $\frac{22}{25}$ (r) $\frac{37}{50}$

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Work It Out!
(a) 50%
(b) 25%
(c) 25% lost, 75% remaining
(d) 40%
(e) $12\frac{1}{2}$%
(f) 85%, 15% incorrect
(g) (i) $\frac{1}{10}$, 10%
(ii) $\frac{1}{2}$, 50%
(iii) $\frac{3}{10}$, 30%
(iv) $\frac{1}{5}$, 20%
(v) 0, 0%
(h) English: 75%
Irish: 65%
Maths: 80%
History: 90%
Geography: $87\frac{1}{2}$%
Science: 85%

1. (a) 0.4 (b) 0.9 (c) 31% (d) $\frac{5}{10}$ (e) 30% (f) 0.54 (g) 0.52 (h) $\frac{3}{4}$ (i) 1.32 (j) 2 (k) 0.5 (l) 12%

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2. (a) < (b) < (c) < (d) = (e) < (f) < (g) = (h) < (i) < (j) < (k) = (l) >

3. (a) 0.18, 80%, $\frac{81}{100}$
(b) 21%, 0.24, $\frac{1}{2}$
(c) 0.01, $\frac{1}{10}$, 11%
(d) 14%, $\frac{1}{4}$, 0.41
(e) 15%, $\frac{1}{5}$, 0.51
(f) 0.35, 53%, $\frac{3}{5}$
(g) $\frac{1}{20}$, 12%, 0.2
(h) 0.4, 54%, $\frac{4}{5}$
(i) $\frac{1}{8}$, 0.18, 81%
(j) 13%, 0.3, $\frac{1}{3}$
(k) $\frac{5}{8}$, 0.8, 85%
(l) 0.002, 3%, $\frac{2}{3}$

4. (a) $\frac{1}{4}$ (b) 7.5 (c) 1.25 (d) 3% (e) 5% (f) $\frac{3}{5}$ (g) 0.4 (h) 0.12

5. (a) True (b) False (c) False (d) True (e) False (f) True (g) True (h) False (i) True (j) False (k) False (l) True

Work It Out!
1. (a) (i) Fran: $\frac{3}{4}$, 0.75, 75%
(ii) Dee: $\frac{4}{5}$, 0.8, 80%
(iii) Percy: $\frac{7}{10}$, 0.7, 70%
(b) (i) Fran has sold 90 tickets
(ii) Dee has sold 96 tickets
(iii) Percy has sold 84 tickets
2. (a) (i) Red
(ii) Orange
(b) 20%
(c) (i) Red 30; Blue 25; Green 20; Purple 10; Yellow 10; Orange 5
(ii) Red 300; Blue 250; Green 200; Purple 100; Yellow 100; Orange 50
(iii) Red 150; Blue 125; Green 100; Purple 50; Yellow 50; Orange 25

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1. (a) (i) €40
(ii) €20
(iii) €8
(iv) €4
(v) €16
(b) (i) €180
(ii) €90
(iii) €36
(iv) €18
(v) €72
(c) (i) €600
(ii) €300
(iii) €120
(iv) €60
(v) €240
(d) (i) €10
(ii) €5
(iii) €2
(iv) €1
(v) €4
(e) (i) €2.50
(ii) €1.25
(iii) 50c
(iv) 25c
(v) €1
(f) (i) €7.50
(ii) €3.75
(iii) €1.50
(iv) 75c
(v) €3
3. (a) (i) €30
(ii) €120
(iii) €2,100
(iv) €12.50
(b) (i) €30
(ii) €80
(iii) €700
(iv) €1.50
(c) (i) €9
(ii) €15

(iii) €350
(iv) €1.20
(d) (i) €14
(ii) €26
(iii) €1,040
(iv) €1.60

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4. (a) 148 good apples
(b) 26 km
(c) 4 wrong
(i) 10 wrong
(ii) 14 wrong
(d) 24 pages
(e) (i) 75% left
(ii) $\frac{3}{4}$
(iii) 25% used
(iv) $\frac{1}{4}$
(v) 40 mins
(vi) 160 mins
(vii) 2 hrs 40 mins
5. (a) 40% beef
(b) (i) 84 salmon
(ii) 56 beef

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1. (a) (i) 11 (ii) 14 (iii) 8 (iv) 5
(b) (i) 18 (ii) 15 (iii) 3 (iv) 8
(c) (i) 21 (ii) 31 (iii) 16 (iv) 13
2. (a) €70 (b) €207 (c) €135 (d) €52 (e) €76 (f) €50 (g) €180 (h) €180
3. (a) €35
(b) €103.50
(c) €67.50
(d) €26
(e) €38
(f) €25
(g) €90
(h) €90

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4. (a) 450 g
(b) 960 ml
(c) 1.65 l
(d) 2.5 kg
(e) 650 g
(f) 21 l
(g) 600 g
(h) 560 ml
6. (a) (i) €38.17
(ii) €53.46
(iii) €64.24
(iv) €30.69
(v) €46.75
(b) €31
(c) Table 2 €55, Table 3 €65
(d) Table 1 €40, Table 5 €50
7. Could use the % key on the calculator e.g. for Question 2 (a) input 140 – 50 % and for Question 6 (a) input 3.47 + 10 %

Work It Out!
(a) 350 ml
(b) €816.40
(c) €28.84
(d) 6 g
(e) 5.98 g

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1. (a) 1 m (b) 1 km (c) 1 cm (d) 1 mm (e) 1 m (f) 1 cm (g) 1 m (h) 1 mm
2. (a) Yes (b) No (c) No (d) Yes (e) Yes (f) No

Work It Out!
(a) 23 mm
(b) 6 mm
(c) 21 mm, 23 mm
(d) 18 mm
(e) 21 mm

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1. (a) 40 mm
(b) 95 mm
(c) 70 mm
(d) 154 mm
(e) 110 mm
(f) 53 mm
(g) 480 mm
(h) 37.5 mm
(i) 390 mm
(j) 640 mm
(k) 52 mm
(l) 985 mm
2. (a) 30 mm
(b) 35 mm
(c) 60 mm
(d) 72 mm
(e) 88 mm
3. (a) 6 cm, 3 cm
(b) 3.5 cm, 5.5 cm
(c) 4.75 cm, 5.25 cm
4. (a) 4 cm
(b) 5.5 cm
(c) 10 cm
(d) 10.5 cm
(e) 7.6 cm
(f) 6.7 cm
(g) 8.1 cm
(h) 9.5 cm

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Work It Out!
(a) 35 mm
(b) (i) 72 mm
(ii) 7.2 cm
(c) 6.3 cm – 3.4 cm = 2.9 cm
(d) (i) 16 coins
(ii) 50 coins
(iii) 800 coins

1. (a) Trundle wheel
(b) Centimetre ruler
(c) Measuring tape
(d) Measuring tape
(e) Centimetre ruler
(f) Centimetre ruler
(g) Trundle wheel
(h) Centimetre ruler/metre strip
(i) Centimetre ruler
(j) Centimetre ruler
(k) Trundle wheel
(l) Metre strip

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Work It Out!
(a) 27 days
(b) 162.56 cm
(c) (i) Amy 162 cm, Eoin 177 cm, Lucy 183 cm, Clara 172 cm, Martha 168 cm, Isabel 156 cm, Oisín 183 cm, Jack 188 cm, Conor 180 cm
(ii) Amy 1.62 m, Eoin 1.77 m, Lucy 1.83 m, Clara 1.72 m, Martha 1.68 m, Isabel 1.56 m, Oisín 1.83 m, Jack 1.88 m, Conor 1.8 m
(iii) Isabel
(iv) Jack
(v) Isabel 156 cm, Amy 162 cm, Martha 168 cm, Clara 172 cm, Eoin 177 cm, Conor 180 cm, Lucy 183 cm, Oisín 183 cm, Jack 188 cm

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1. A: lengths of sides are 29, 8, 29 and 8 mm. Perimeter = 74 mm = 7.4 cm
B: lengths of sides are 13, 13, 13, 13 and 13 mm. Perimeter = 65 mm = 6.5 cm
C: lengths of sides are 38, 36 and 12 mm. Perimeter = 86 mm = 8.6 cm
D: lengths of sides are 15, 12, 12, 15, 12 and 12 mm. Perimeter = 78 mm = 7.8 cm
E: lengths of sides are 29, 15, 22 and 18 mm. Perimeter = 84 mm = 8.4 cm
F: lengths of sides are 32, 18, 8, 8, 13, 8, 11 and 18 mm. Perimeter = 116 mm = 11.6 cm

2. A: perimeter = 113 mm = 11.3 cm
B: perimeter = 130 mm = 13 cm
C: perimeter = 85 mm = 8.5 cm

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Work It Out!

1. **(a)** 92 cm
(b) 75 m
2. **(a)** 9 cm
(b) 12.2 cm
(c) **(i)** 70 m
(ii) 875 blocks
(d) €68.40
(e) 286 cm

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1. **(a)** A: 12 cm^2, B: 16 cm^2, C: 15 cm^2, D: 12 cm^2
2. **(a)** Each rectangle has an area of 24 cm^2
(b) They all have the same area even though they are different shapes
(c) 24 × 1, 12 × 2, 8 × 3 and 6 × 4
(d) They are all factors of 24
(e) Multiply the length by the width of a rectangle to find its area.

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1. **(b)** A: length = 4 cm and width = 3 cm
B: length = 5 cm and width = 2 cm
C: length = 8 cm and width = 2 cm
D: length = 9 cm and width = 4 cm
E: length = 7 cm and width = 4 cm
F: length = 4 cm and width = 3 cm
G: length = 6 cm and width = 3 cm
(c) A: area = 12 cm^2
B: area = 10 cm^2
C: area = 16 cm^2
D: area = 36 cm^2
E: area = 28 cm^2
F: area = 12 cm^2
G: area = 18 cm^2

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4. **(d)** Soccer pitch: 10,800 m^2
Basketball court: 420 m^2
Tennis court: 260.7 m^2
(e) Tennis court
(f) Soccer pitch
(g) 41
(h) 26
(i) **(i)** 420 m
(ii) 86 m
(iii) 69.4 m
(j) perimeter, m

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Work It Out!

(a) 120 m^2
(b) 81 m^2
(c) 511.2 m^2
(d) 32.2 m^2
(e) 73.8 m^2

Work It Out!

(a) 21 m
(b) 900 m^2
(c) 23 m
(d) €149.90
(e) **(i)** 4 m **(ii)** 48 m^2
(f) 81 m^2
(g) 180 m^2
(h) 288 m^2

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1. **(c)** A: 29.75 cm^2, B: 48 cm^2, C: 62 cm^2, D: 32 cm^2
(d) A: 26 cm, B: 36 cm, C: 38 cm, D: 30 cm

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Work It Out!

(a) 18 cm^2
(b) 74 m^2
(c) **(i)** 64 m^2, 96 m^2
(ii) €20.48
(iii) €80

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1. **(a)** **(i)** 1,400 m, 1.4 km
(ii) 1,000 m, 1 km
(b) A trundle wheel
(c) **(i)** 3,700 m, 3.7 km
(ii) 950 m, 0.95 km
(iii) 800 m, 0.8 km
(d) **(i)** 25,200 m^2
(ii) 60,000 m^2
(iii) 40,000 m^2
(e) $\frac{17}{28}$
(f) **(i)** 24,000 m^2
(ii) 10,000 m^2
(iii) 15%

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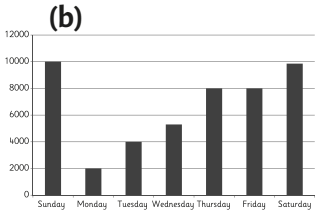
2. **(a)** **(i)** 0.91 m
(ii) 910 mm
(b) **(i)** 21 months
(ii) 1 year 9 months
3. **(a)** Sunday: 10,000, Monday: 2,000, Tuesday: 4,000, Wednesday: 5,000, Thursday: 8,000, Friday: 8,000, Saturday: 10,000.
(b)



(c) 46,407
(d) 6,630
(e) Monday
(f) Saturday
4. **(a)** **(i)** 90
(ii) 120
(iii) 60
(iv) 45
(v) 45
(b) Monkey enclosure
(c) Seal enclosure and reptile house
(d) 50%
(e) $\frac{1}{2}$

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1. **(a)** 98
(b) 88
(c) 666
(d) 885
(e) 1,187
(f) 3,900
(g) 7,600
(h) 10,900
(i) 34,800
(j) 49,900
(k) 6.5
(l) 12.9
(m) 0.79
(n) 0.667
(o) 0.798
(p) 0.799
2. **(a)** 35
(b) 53
(c) 356
(d) 352
(e) 342
(f) 3,224
(g) 4,661
(h) 6,843
(i) 31,491
(j) 64,337
(k) 4.4
(l) 6.1
(m) 6.25
(n) 0.341
(o) 0.336
(p) 0.313

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3. **(a)** 89
(b) 999
(c) 1,798
(d) 3,991
(e) 42,864
(f) 59,992
(g) 27.5
(h) 89.9
(i) 1.78
(j) 0.888
(k) 54
(l) 266
(m) 551
(n) 3,842
(o) 44,431
(p) 64,357
(q) 11.1
(r) 5.22

Work It Out!
(a) 0.959 kg
(b) €18,090
(c) 41,130 people

1. Possible combinations
- 30 + 70 = 100
- 0.05 + 0.95 = 100
- 100 + 900 = 1,000
- 5,500 + 4,500 = 10,000
- 1.7 + 2.3 = 40
- 25 + 475 = 500
- 0.75 + 0.25 = 100
- 8,000 + 2,000 = 10,000
- 75 + 25 = 100
- 350 + 650 = 1,000
- 0.4 + 0.6 = 10

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2. **(a)** 103
(b) 99
(c) 625
(d) 1,014
(e) 1,221
(f) 1,876
(g) 3,986
(h) 6,636
(i) 35,164
(j) 40,600
(k) 28.2
(l) 88.3
(m) 1.91
(n) 0.723
(o) 0.75

3. **(a)** 29
(b) 49
(c) 260
(d) 288
(e) 3,472
(f) 4,568
(g) 6,769
(h) 30,891
(i) 63,667
(j) 3.7
(k) 5.9
(l) 6.2

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1. **(a)** 480
(b) 17
(c) 4,300
(d) 520
(e) 6.5
(f) 0.6
(g) 480
(h) 17
(i) 4,300
(j) 520
(k) 6.5
(l) 0.6

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3. **(a)** 15
(b) 35
(c) 34
(d) 21
(e) 500
(f) 500
(g) 500
(h) 630
(i) 0.5
(j) 0.9
(k) 0.05
(l) 0.008

4. **(a)** 280
(b) 480
(c) 1,440
(d) 1,640
(e) 13,160
(f) 15,780
(g) 21,780
(h) 31,850
(i) 6.2
(j) 4.7
(k) 4.46
(l) 3.705

5. **(a)** 15
(b) 390
(c) 91
(d) 554
(e) 324
(f) 1,395
(g) 725
(h) 8,322
(i) 2,350
(j) 54,925
(k) 481
(l) 92,222
(m) 0.7
(n) 14.43
(o) 0.37

Work It Out!
(a) 0.16 kg
(b) 7,400 people
(c) 89 years
(d) 5.8 m
(e) 0.109 kg
(f) €24,500
(g) 1.23 l
(h) **(i)** 3,280 tablets
(ii) 8,870 tablets
(iii) 5,590 tablets

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1. **(a)** 360 passengers
(b) 373 people
(c) 520

2. **(a)** €2,478
(b) 7,874 people
(c) 1.36 kg loss
(d) 1041 employees

3. Example: in question 1(a) it is simpler to add on 20.

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4. **(a)** 3.97
(b) 4.61
(c) 28,900
(d) 760
(e) 6,045
(f) 0.42
(g) 0.22
(h) 17,500
(i) 800
(j) 2,600

5. **(a)** **(i)** 440
(ii) 1,040
(b) **(i)** 4,890
(ii) 5,160
(c) **(i)** 35,623
(ii) 45,623
(d) **(i)** 5.7
(ii) 4.9
(e) **(i)** 3,080
(ii) 2,880
(f) **(i)** 68,940
(ii) 80,340

7. **(a)** False, 6.1
(b) True
(c) False, 5.76
(d) True

Work It Out!
1. **(a)** Profit of €6,750
(b) 13.2 kg
(c) **(i)** Rivertown by 7.2 km
(ii) 119.8 km

2. **(a)** 840 – 365 = 475
841 – 366 = 475
842 – 367 = 475
843 – 368 = 475
844 – 369 = 475
(b) **(i)** 6,277
(ii) 6,187

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1. **(a)** 2, 4
(b) 1, 3
(c) –2°C, 10°C, –8°C, 12°C
(d) A: 5°C above zero
B: 15°C above zero
C: 1°C below zero
D: 5°C below zero
E: 18°C above zero
F: 7°C above zero
G: 4°C below zero
H: 9°C below zero
(e) **(iii)** 11°C
(iv) 15°C
(v) 26°C
(vi) 15°C
(vii) 16°C
(viii) 21°C

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2. **(a)** Credit
(b) Debit
(c) Debit
(d) Credit

3. (a) D
(b) C
(c) B
(d) D, G, B, E
(e) C, H, A, F
(f) (i) 210 m
(ii) 275 m
(iii) 58 m
(iv) 11,030 m
(v) 768 m

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2. (a) (i) −2
(ii) 3
(iii) 0
(iv) 1
(v) −1
(b) Outpatients and radiology
(c) Surgical wards and maintenance
(d) (i) 4
(ii) 4
(iii) 2
(iv) 3
(v) 6
(e) (i) Radiology
(ii) Medical wards
(iii) Maintenance
(iv) Medical wards
(v) Paediatric wards
(vi) Medical wards

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3. (a) +6°C
(b) −€20
(c) −10°C
(d) −75 m
(e) +12
(f) −2
(g) +€40
(h) +1,039 m
(i) +4
(j) −7
1. A = −8
B = −6
C = −2
D = +1
E = +7
F = +9
2. (a) F = +9
(b) A = −8
(c) D = +1
(d) F = +9

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3. G = −35
H = −15
I = −5
J = +15,
K = +30
L = +40
4. (a) L = +40
(b) G = −30
(c) I = −5
(d) L = +40
5. (a) >
(b) =
(c) <
(d) >
(e) <
(f) >
(g) <
(h) <
6. (a) 3°C, −1°C, −5°C,
(b) +114 m, +35 m, −156 m
(c) €25, −€15, −€30
(d) +15, −24, −32
(e) +12°C, −9°C, −35°C
(f) −14 m, −29 m, −213 m

Work It Out!

(a) February
(b) (i) Sometimes true: 0 is neither positive nor negative, but any non-zero without any sign is positive
(ii) Never true
(iii) Always true
(iv) Never true
(v) Always true
(vi) Always true
(vii) Never true
(c) (i) Dublin
(ii) Jericho
(iii) New Orleans

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1. (a) Athens
(b) Moscow
(c) Helsinki
(d) (i) 7°C
(ii) 15°C
(iii) 29°C
(e) (i) 5°C
(ii) 13°C
(iii) 15°C
(f) −4°C
(g) 5°C
(h) Paris
(i) Rome
(j) Oslo and Rome; Warsaw and Madrid; Paris and Helsinki

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2. (a) Faster
(b) Slower
(c) 3rd
(d) 2nd and 4th
(e) 3rd
(f) Most uphill
(g) 2nd
(h) Downhill and early on in run
(i) 27 mins 10 secs
(j) Faster
3. (a) 22
(b) 17
(c) 35
(d) −7
(e) −15
(f) 44
(g) 19

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1. (a) A: balance scales
B: spring balance
C: kitchen scales
D: weigh bridge
E: Supermarket scales
F: bathroom scales
(b) (i) Kitchen scales or balance scales
(ii) Supermarket scales or spring balance
(iii) Bathroom scales
(c) (i) Kitchen scales
(ii) Weigh bridge
(iii) Weigh bridge
(iv) Supermarket scales
(v) Spring balance
(vi) Kitchen scales
(vii) Bathroom scales
(viii) Spring balance
(ix) Kitchen scales
(x) Kitchen scales
(xi) Kitchen scales
(xii) Supermarket scales
(xiii) Bathroom scales
(d) Apple, margarine, school bag, broccoli, salmon, suitcase
(e) Decisions will be made by weighing the evidence in a fair manner.

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Work It Out!

(a) (i) Bathroom scales
(ii) 4.917 kg
(iii) 2.643 kg
(iv) 66.6 kg
(v) 22.2 kg
(b) (i) Supermarket scales
(ii) 295 g
(iii) 290 g
(iv) No, the average changed

3. **(a)** 3 kg **(b)** 3 g **(c)** 454 g **(d)** 3 kg **(e)** 93 g **(f)** 400 g

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1. **(b)** $\frac{7}{10}$ kg = 0.7 kg
(c) $\frac{2}{100}$ kg = 0.02 kg
(d) $\frac{9}{1000}$ kg = 0.009 kg
(e) $5\frac{1}{2}$ kg = 5.5 kg
(f) $\frac{48}{100}$ kg = 0.48 kg
(g) $\frac{95}{1000}$ kg = 0.095 kg
(h) $1\frac{5}{100}$ = 1.05 kg
(i) $4\frac{7}{10}$ kg = 4.7 kg
(j) $2\frac{125}{1000}$ kg = 2.125 kg
(k) $9\frac{45}{100}$ kg = 9.45 kg
(l) $1\frac{876}{1000}$ kg = 1.876 kg
(m) $3\frac{742}{1000}$ kg = 3.742 kg
(n) $1\frac{6}{1000}$ kg = 1.006 kg

2. **(b)** $1\frac{1}{2}$ kg = 1,500 g
(c) $2\frac{4}{5}$ kg = 2,800 g
(d) $\frac{1}{100}$ kg = 10 g
(e) $\frac{3}{50}$ kg = 60 g
(f) $1\frac{5}{200}$ kg = 1025 g
(g) $5\frac{6}{125}$ kg = 5,048 g
(h) $7\frac{3}{1000}$ kg = 7,003 g
(i) $4\frac{9}{1000}$ kg = 4,009 g
(j) $3\frac{975}{1000}$ kg = 3,975 g
(k) $6\frac{908}{1000}$ kg = 6,908 g
(l) $9\frac{303}{1000}$ kg = 9,303 g

3. **(a)** 400 g = $\frac{400}{1000}$ kg = $\frac{40}{100}$ kg = $\frac{4}{10}$ kg = $\frac{2}{5}$ kg
(b) 125 g = $\frac{125}{1000}$ kg = $\frac{1}{8}$ kg
(c) 2,100 g = $2\frac{100}{1000}$ kg = $2\frac{10}{100}$ kg = $2\frac{1}{10}$ kg
(d) 50 g = $\frac{50}{1000}$ kg = $\frac{5}{100}$ kg = $\frac{1}{20}$ kg
(e) 150 g = $\frac{150}{1000}$ kg = $\frac{15}{100}$ kg = $\frac{3}{20}$ kg
(f) 750 g = $\frac{750}{1000}$ kg = $\frac{75}{100}$ kg = $\frac{3}{4}$ kg
(g) 875 g = $\frac{875}{1000}$ kg = $\frac{7}{8}$ kg
(h) 570 g = $\frac{570}{1000}$ kg = $\frac{57}{100}$ kg
(i) 900 g = $\frac{900}{1000}$ kg = $\frac{90}{100}$ kg = $\frac{9}{10}$ kg
(j) 925 g = $\frac{925}{1000}$ kg = $\frac{37}{40}$ kg
(k) 80 g = $\frac{80}{1000}$ kg = $\frac{8}{100}$ kg = $\frac{2}{25}$ kg
(l) 1,250 g = $1\frac{250}{1000}$ kg = $1\frac{25}{100}$ kg = $1\frac{1}{4}$ kg

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4. **(a)** < **(b)** = **(c)** < **(d)** < **(e)** > **(f)** < **(g)** > **(h)** < **(i)** = **(j)** < **(k)** > **(l)** =

Work It Out!

(a) **(i)** 100 g
(ii) 500 g
(b) **(i)** 1 kg 978 g
(ii) Supermarket/ Butcher's scales
(c) **(i)** 11 kg 400 g
(ii) 4 kg 275 g
(d) **(i)** Kitchen scales
(ii) 750 g
(iii) $\frac{375}{1000}$ kg = $\frac{3}{8}$ kg
(iv) 0.675 kg
(v) 1,800 g /1 kg 800 g
(vi) 3 kg of flour, 1 kg 500 g of sugar and 2 kg 700 g of butter

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Work It Out!

(a) Teresa weighs herself first, then weighs herself and the baby and subtracts her weight from the total weight of herself and the baby.
(b) Split the tennis balls into 3 groups – 3, 3 and a 2. Compare the two groups of three on the balance scales. If they are equal then the heaviest ball is in the group of two – just compare the two in that group on the scales to find the heaviest. If one of the groups of three is the heaviest, then compare any two balls from that group. If they are equal the heaviest is the tennis ball not on the scales and if they are not equal the heaviest is on the scales.
(c) **(i)** 1 kg and 3 kg weights on side A and 4 kg potatoes on side B
(ii) 1 kg and 9 kg weights on side A and 10 kg potatoes on side B
(iii) 9 kg and 3 kg weights on side A and 11 kg potatoes and 1 kg weight on side B
(iv) 27 kg weight on side A and 17 kg potatoes and 9 kg and 1 kg weights on side B
(v) 27 weight on side A and 23 kg potatoes and 1 kg and 3 kg weights on side B
(vi) 27 kg weight on side A and 26 kg potatoes and 1 kg weight on side B
(vii) 27 kg and 9 kg weights on side A and 32 kg potatoes and 1 kg and 3 kg weights on side B
(viii) 27 kg, 9 kg, 3 kg and 1 kg weights on side A and 40 kg potatoes on side B

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1. **(a)** 4 **(b)** 7 **(c)** 2 **(d)** 9 **(e)** 5 **(f)** 10 **(g)** 1 **(h)** 6 **(i)** 3 **(j)** 8

2. **(i)** 2, 4, 6, 8, 10
(ii) 1, 3, 5, 7, 9

3. **(c)** Even: 16, 12, 14; Odd: 19, 17, 11, 13

4. (i) Even number are all even, no parts jutting out
   (ii) Odd always has one square/cube on its own
5. (a) (i) 54,912 234 8 76 6,740
   (ii) 49 9,575 84,267 841 3
   (b) 1.2, 6.8
   (c) (i) All whole numbers with 2, 4, 6, 8 or 0 units
   (ii) All whole numbers with 1, 3, 5, 7 or 9 units
6. (a) 30, 32, 34, 36, 38, 40
   (b) 166, 168, 170, 172, 174, 176, 178, 180, 182
   (c) 898, 900, 902, 904, 906, 908, 910, 912
7. (a) 41, 43, 45, 47, 49, 51, 53
   (b) 189, 191, 193, 195, 197, 199, 201
   (c) 999, 1,001, 1,003, 1,005, 1,007, 1,009, 1,011

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8. (a) Even (b) Even (c) Odd (d) Odd (e) Even (f) Even (g) Odd
9. Definitely incorrect: (b), (d), (e), (h)
10. (a) Odd
    (b) Even
    (c) Even

Work It Out!

1. (a) Never true
   (b) Always true
   (c) Never true
   (d) Never true
   (e) Never true
2. (a) 3
   (b) 2

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1. 1 row of 24 chairs
   2 rows of 12 chairs
   3 rows of 8 chairs
   6 rows of 4 chairs
   8 rows of 3 chairs
   12 rows of 2 chairs
   24 rows of 1 chair
2. (a) 1, 2, 3, 6
   (b) 1, 2, 4, 8
   (c) 1, 3, 9
   (d) 1, 2, 3, 4, 6, 12
   (e) 1
   (f) 1, 3, 5, 15
   (g) 1, 2, 4, 8, 16
   (h) 1, 2, 3, 6, 9, 18
   (i) 1, 19
   (j) 1, 3, 7, 21

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3. (a) 1 × 20, 2 × 10, 4 × 5
   (b) 1 × 28, 2 × 14, 4 × 7
   (c) 1 × 30, 2 × 15, 3 × 10, 5 × 6
   (d) 1 × 32, 2 × 16, 4 × 8
   (e) 1 × 34, 2 × 17
   (f) 1 × 35, 5 × 7
   (g) 1 × 36, 2 × 18, 3 × 12, 4 × 9, 6 × 6
   (h) 1 × 40, 2 × 20, 4 × 10, 5 × 8
   (i) 1 × 41
   (j) 1 × 48, 2 × 24, 3 × 16, 4 × 12, 6 × 8
4. (a) 4, 21, 28
   (b) 3, 15, 20
   (c) 2, 20, 50, 75
   (d) 2, 7, 20
   (e) 1, 90
   (f) 7
5. (a) 5 (b) 10 (c) 2 (d) 9 (e) 3 (f) 36
6. (a) 55, 671
   (b) 83, 421
   (c) 54, 552
   (d) 45, 443
   (e) 82, 465
   (f) 68, 313
8. (a) Always true
   (b) Always true
   (c) Always true
   (d) Sometimes true: can be the same size
   (e) Sometimes true: can be the same size
   (f) Always true
   (g) Sometimes true: every second multiple of an odd number is odd
   (h) Always true
   (i) Always true
   (j) Sometimes
   (k) Never
   (l) Sometimes

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Work It Out!

(a) 12
(b) 36
(c) 31st May
(d) (i) 19
   (ii) 39
   (iii) 3 × 13

1. (a) 20, 30, 42
   (b) 16, 25, 36
   (c) 10, 15, 21
2. (a) (i) 5, 10, 48
   (ii) 21, 28, 45
   (b) (i) 4, 12
   (ii) 2, 8, 12, 20, 30
   (c) (i) 84, 96, 100, 121, 144
   (ii) 64, 81

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3. - $4^2 = 4 \times 4 = 16$
   - $5^2 = 5 \times 5 = 25$
   - $6^2 = 6 \times 6 = 36$
   - $7^2 = 7 \times 7 = 49$
   - $8^2 = 8 \times 8 = 64$
   - $9^2 = 9 \times 9 = 81$
   - $10^2 = 10 \times 10 = 100$
4. (a) 4
   (b) 9
   (c) 16
   (d) All square numbers
5. (a) (i) 25
   (ii) 64
   (iii) 100
   (b) Because the answer is also the square number
6. (a) 10
   (b) 21
   (c) 55

Work It Out!

(a) Always true
(b) Always true
(c) Always true
(d) Never true
(e) Always true

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1. (a) 1 × 23
   (b) No
2. (b) (i) 2, 3, 5, 7
   (ii) 4, 6, 8, 9, 10
   (iii) 1
   (c) (i) 2
   (ii) 3
   (iii) 9
   (d) 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
   (e) 4, 6, 8, 9, 10, 12, 14, 15, 16, 18
3. Question 2: (i) 19
   Question 3: (i) 41
4. (b) (i) 27, 33
   (ii) 31, 47

Work It Out!

(a) (i) Prime
   (ii) Composite
   (iii) Composite
   (iv) Prime
   (v) Composite
   (vi) Composite
   (vii) Prime
   (viii) Prime
(b) 15

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1. (a) D, F, G, G, D, F, G, G, D, F, G, G
   (b) J, J, K, K, L, J, J, K, K, L, J, J
   (c) P, Q, P, R, P, Q, P, R, P, Q, P
   (d) T, U, U, Y, T, U, U, Y, T, U, U
   (e) Z, X, C, C, X, Z, Z, X, C, C, X, Z, Z
   (f) B, N, B, B, N, B, B, N, B, B, N, B

2. (a) 56, 63, 70
   (b) 250, 275, 300
   (c) 3.5, 2.5, 1.5
   (d) −2, 0, 2
   (e) 5.4 m, 4.5 m, 3.6 m
   (f) −2, −5, −8
   (g) 0.9 l, 0.96 l, 1.02 l
   (h) 15, 21, 28
   (i) 1.406 kg, 1.416 kg, 1.426 kg
   (j) 25, 36, 49
   (k) $1\frac{2}{3}, 1\frac{5}{6}, 2$
   (l) 180°, 225°, 270°

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3. (a) $5\frac{3}{8}, 5\frac{1}{4}, 5\frac{1}{8}$
   (b) 01:20, 02:20, 03:20
   (c) 23:45, 23:15, 22:45
   (d) 357, 360, 362
   (e) 286, 301, 297
   (f) 417, 413, 416
   (g) 46, 92, 94
   (h) 243, 729, 2,187
4. (a) 4,096, 16,384, 65,536 (powers of 4)
   (b) 667, 651, 636
   (c) 54, 52.6, 51.2
   (d) 4.28, 3.22, 2.16
   (e) 512, 1,024, 2,048 (doubling)
   (f) 610, 987, 1,597 (Fibonacci sequence)
   (g) 2.5, 1.25, 0.625 (halving)
   (h) 41.44, 82.88, 165.76 (doubling)
5. Question 2 (l): degrees in a rotation, so will go back to 0
   Question 3 (b) and (c): time, so will repeat after 24 hours

Work It Out!

(a)
1. (a) F, G, G
   (b) K, K, L
   (c) Q, P, R
   (d) U, U, Y
   (e) C, X, Z
   (f) B, N, B
2. (a) 0, 7, 14
   (b) 50, 75, 100
   (c) 11.5, 10.5, 9.5
   (d) -16, -14, -12
   (e) 12.6 m, 11.7 m, 10.8 m
   (f) 19, 16, 13
   (g) 0.48 l, 0.54 l, 0.6 l
   (h) not possible – triangular numbers
   (i) 1.346 kg, 1.356 kg, 1.366 kg
   (j) not possible – square numbers
   (k) $\frac{2}{3}, \frac{5}{6}, 1$
   (l) $-45^0, -90^0, -135^0$
3. (a) $6\frac{3}{8}, 6\frac{1}{4}, 6\frac{1}{8}$
   (b) 19:20, 20:20, 21:20
   (c) 02:45, 02:15, 01:45
   (d) 337, 340, 342
   (e) 242, 257, 253
   (f) 421, 417, 420
   (g) -1, 1, 2
   (h) not possible – cubed numbers
4. (a) not possible – powers of 4
   (b) 780, 757, 735
   (c) 63.8, 62.4, 61
   (d) 11.7, 10.64, 9.58
   (e) 4, 8, 16
   (f) 13, 21, 34
   (g) 320, 160, 80
   (h) 0.32375, 0.6475, 1.295

Work It Out!

(a) 29
(b) 80, 120
(c) (i) 0
   (ii) −5
(d) 15, 18
(e) 35 mins

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1. (a) 3, 4, 5, 6, 7, 8, 9
   (b) 2, 4, 6, 8, 10, 12, 14
   (c) 4, 8, 12, 16, 20, 24, 28
   (d) 1, 4, 9, 16, 25, 36, 49
   (e) 4, 7, 10, 13, 16, 19, 22
   (f) 2, 6, 12, 20, 30, 42, 56

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2. Sequence (d) are square numbers and sequence (f) are rectangular numbers (which are double triangular numbers).
3. (a) (a) Term + 2 = Squares
   (b) Term × 2 = Squares
   (c) Term × 4 = Shapes
   (d) Term × Term (or Term squared) = Triangles
   (e) (Term × 3) + 1 = Lines
   (f) Term × (Term + 1) = Circles
   (b) (a) 12, 14, 22
   (b) 20, 24, 40
   (c) 40, 48, 80
   (d) 100, 144, 400
   (e) 31, 37, 61
   (f) 110, 156, 420

Work It Out!

(a) (i) 21
   (ii) 84
(b) (i) 60 mins
   (ii) Week 8
(c) 6,400
(d) (i) 3
   (ii) 4
   (iii) 5
(e) (i) 8
   (ii) 9
   (iii) 10
(f) (i) 20
   (ii) 30
   (iii) 42
(g) (i) 15
   (ii) 36
   (iii) 55

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2. (a) (i) 23
   (ii) 23
   (b) (i) 4
   (ii) 18
   (c) (i) 27
   (ii) 3
   (d) (i) 72
   (ii) 72
   (e) (i) 15
   (ii) 15
   (f) (i) 10
   (ii) 4
   (g) (i) 16
   (ii) 4
   (h) (i) 14
   (ii) 32
   (i) (i) 1
   (ii) 16
   (j) (i) 6
   (ii) 54
   (k) (i) 72
   (ii) 72
   (l) (i) 20
   (ii) 20
   (m) (i) 21
   (ii) 33
   (n) (i) 5
   (ii) 20
   (o) (i) 5
   (ii) 12

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5. (a) Same: 13
   (b) Different: 10, 16
   (c) Different: 23, 35
   (d) Same: 70
   (e) Different: 16, 44
   (f) Different: 2, 50
   (g) Different: 8, 2
   (h) Same: 70
6. (a) Same: 20.29
   (b) Different: 10.31, 19.79
   (c) Different: 11.5, 4

(d) Different: 27, 4.6
(e) Different: 711, 285
(f) Different: 1,362, 3,360

Work It Out!
(a) $6 \times (5 + 4) = 54$
(b) $(4 \times 12) - 16 = 32$
(c) $3 \times (6 \times 5) = 90$
(d) $(400 \div 10) - 12 = 28$

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1. (a) 23 (b) 14 (c) 21 (d) 10 (e) 5 (f) 33 (g) 33 (h) 1

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2. (a) 13 (b) 22 (c) 9 (d) 75 (e) 17 (f) 24 (g) 28 (h) 14 (i) 9 (j) 9 (k) 19 (l) 11 (m) 16 (n) 3 (o) 34 (p) 1 (q) 20 (r) 15 (s) 24 (t) 3

Work It Out!
(a) (i) $9 \times 5 + 2 = 47$
(ii) $(84 - 3) \div 9 = 9$
(iii) $4 \times (6 - 3) = 21$
(iv) $18 - (4 \times 3) = 6$
(v) $49 \div 7 + 5 = 12$
(vi) $7 \times 8 \div 4 = 14$
(b) Some possibilities:
(i)
- $2 = (2 \times 3) - 4 = (4 + 2) \div 3 = (4 - 3) \times 2$
- $3 = (4 + 2) - 3 = (4 - 3) + 2 = (2 - 3) + 4$
- $4 = (3 - 2) \times 4$
- $5 = (3 - 2) + 4$
- $6 = (3 \div 2) \times 4 = (3 \times 4) \div 2$
- $9 = 4 + 2 + 3$
- $10 = (2 \times 3) + 4 = (3 \times 4) - 2$
- $11 = (4 \times 2) + 3$
- $14 = (3 \times 4) + 2$

(ii) $24 = 4 \times 2 \times 3$
(iii) $-4 = (2 - 3) \times 4$
(iv) $1\frac{1}{2} = (2 \times 3) \div 4$; $1\frac{1}{4} = (2 + 3) \div 4$

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1. (a) Florida, USA
(b) Portillo, Chile
(c) Portillo, Chile; Mount Cook Village, New Zealand; Canberra, Australia
(d) (i) Canberra, Australia
(ii) Florida, USA
(e) (i) 5°C
(ii) 18°C
(iii) 29°C
(f) (i) 15°C
(ii) 15°C
(iii) 13°C
2. (a) Deal 3 €2,110 (Deal 1: €2,195; Deal 2: €2,187.50)
(b) €85
3. (a) $8.6 \text{ kg} = 8\frac{6}{10} \text{ kg} = 8 \text{ kg } 600 \text{ g}$
$2.25 \text{ kg} = 2\frac{1}{2} \text{ kg} = 2 \text{ kg } 500 \text{ g}$
$11.5 \text{ kg} = 11\frac{1}{2} \text{ kg} = 11 \text{ kg } 500 \text{ g}$
$18.9 \text{ kg} = 18\frac{9}{10} \text{ kg} = 18 \text{ kg } 900 \text{ g}$
$9.6 \text{ kg} = 9\frac{3}{5} \text{ kg} = 9 \text{ kg } 600 \text{ g}$
$7.9 \text{ kg} = 7\frac{9}{10} \text{ kg} = 7 \text{ kg } 900 \text{ g}$
$8.7 \text{ kg} = 8\frac{7}{10} \text{ kg} = 8 \text{ kg } 700 \text{ g}$
(b) (i) Jim
(ii) Michelle
(c) Carry-on baggage
(d) (i) 46.3 kg
(ii) 41.4 kg
(iii) 87.7kg
(e) (i) 3.6 kg
(ii) 3.6 kg

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(f) (i) 9.26 kg
(ii) 20.7 kg
(g) Jim's carry-on bag (1.5 kg) and Claire's checked-in baggage (2.5 kg)
(h) €50 or €60 depending on whether it is per whole kg or part kg
(i) €90 or €100
(j) Up to 6.3 kg of items could be moved from the overweight bags to the underweight bags.
(k) Any bottles or liquids exceeding the 100 ml allowance couldn't be moved from the checked-in bags to the cabin bags.
4. 14:05
5. (a) (i) 61, 67
(ii) 60, 62, 63, 64, 65, 66, 68, 69
(b) (i) 60
(ii) 60 and 65
(iii) 63
(c) 64
(d) 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60
6. (a) 25
(b) 20, 25, 30, 35, 40

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1. (a) A: Eye dropper
B: Measuring spoon
C: Syringe
D: Measuring beaker
E: Graduated cylinder
F: Measuring jug
(b) A: 1 ml
B: 5 ml
C: 20 ml
D: 100 ml
E: 500 ml
F: 1 l
(c) (i) Eye dropper
(ii) Syringe
(iii) Measuring beaker
(iv) Measuring jug
2. (a) Graduated cylinder
(b) Measuring jug
(c) Measuring jug
(d) Measuring spoon, eye dropper, or syringe
(e) Measuring spoon, eye dropper, syringe, or graduated cylinder
(f) Measuring jug
(g) Graduated cylinder
(h) Measuring jug
(i) Measuring beaker
(j) Eye dropper
(k) Graduated cylinder or measuring jug
(l) Measuring jug

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3. (a) 500 ml
(b) 500 ml
(c) 25 ml
(d) 1 l
(e) 750 ml
(f) 5 l

Work It Out!
(a) 2 l 550 ml
(b) 12 l / 12,000 ml
(c) 10 days

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1. **(b)** $\frac{6}{10}$ l = 0.6 l
(c) $\frac{4}{100}$ l = 0.04 l
(d) $\frac{7}{1000}$ l = 0.007 l
(e) $3\frac{1}{2}$ l = 3.5 l
(f) $\frac{42}{100}$ l = 0.42 l
(g) $\frac{75}{1000}$ l = 0.075 l
(h) $2\frac{5}{100}$ l = 2.05 l
(i) $4\frac{3}{10}$ l = 4.3 l
(j) $5\frac{1}{8}$ l = 5.125 l
(k) $7\frac{9}{20}$ l = 7.45 l
(l) $1\frac{476}{1000}$ l = 1.476 l
(m) $3\frac{542}{1000}$ l = 3.542 l
(n) $2\frac{8}{1000}$ l = 2.008 l
(o) $5\frac{5}{1000}$ l = 5.005 l

2. **(b)** $1\frac{1}{2}$ l = 1,500 ml
(c) $2\frac{3}{5}$ l = 2,600 ml
(d) $\frac{1}{100}$ l = 10 ml
(e) $\frac{6}{100}$ l = 60 ml
(f) $\frac{5}{1000}$ l = 5 ml
(g) $2\frac{4}{100}$ l = 2,040 ml
(h) $5\frac{7}{1000}$ l = 5,007 ml
(i) $4\frac{29}{1000}$ l = 4,029 ml
(j) $3\frac{175}{1000}$ l = 3,175 ml
(k) $6\frac{704}{1000}$ l = 6,704 ml
(l) $9\frac{393}{1000}$ l = 9,393 ml
(m) $7\frac{521}{1000}$ l = 7,521 ml
(n) $6\frac{97}{1000}$ l = 6,097 ml
(o) $7\frac{3}{1000}$ l = 7,003 ml

3. **(b)** 700 ml = $\frac{700}{1000}$ l = $\frac{70}{100}$ l = $\frac{7}{10}$ l
(c) 800 ml = $\frac{800}{1000}$ l = $\frac{80}{100}$ l = $\frac{8}{10}$ l = $\frac{4}{5}$ l
(d) 50 ml = $\frac{50}{1000}$ l = $\frac{5}{100}$ l = $\frac{1}{20}$ l
(e) 80 ml = $\frac{80}{1000}$ l = $\frac{8}{100}$ l = $\frac{2}{25}$ l
(f) 150 ml = $\frac{150}{1000}$ l = $\frac{15}{100}$ l = $\frac{3}{20}$ l
(g) 775 ml = $\frac{775}{1000}$ l = $\frac{31}{40}$ l
(h) 571 ml = $\frac{571}{1000}$ l
(i) 988 ml = $\frac{988}{1000}$ l = $\frac{247}{250}$ l
(j) 625 ml = $\frac{625}{1000}$ l = $\frac{125}{200}$ l = $\frac{5}{8}$ l
(k) 2,100 ml = $2\frac{100}{1000}$ l = $2\frac{10}{100}$ l = $2\frac{1}{10}$ l
(l) 1,180 ml = $1\frac{180}{1000}$ l = $1\frac{18}{100}$ l = $1\frac{9}{50}$ l
(m) 1,250 ml = $1\frac{250}{1000}$ l = $1\frac{25}{100}$ l = $1\frac{1}{4}$ l
(n) 6,020 ml = $6\frac{20}{1000}$ l = $6\frac{2}{100}$ l = $6\frac{1}{50}$ l

4. **(a)** 7.506 l
(b) 11.499 l
(c) 5.148 l
(d) 2.212 l
(e) 4.907 l
(f) 5.445 l
(g) 12.815 l
(h) 25.587 l
(i) 6 l
(j) 1.22 l
(k) 1.54 l
(l) 1.58 l

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Work It Out!

(a) **(i)** 2 l 585 ml/2.585 l
(ii) 555 ml
(b) 989 ml/0.989 l
(c) 735 l
(d) €44.48
(e) 8
(f) 25 jugs
(g) 90 drums
(h) 2,520 l
(i) 20,400 l
(j) 5
(k) 4.5 l/$4\frac{1}{2}$ l
(l) Fifteen bottles for €12 as that will cost 40 cent per 250 ml whereas the offer of twenty-four 250 ml bottles is 45 cent per 250 ml.

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Work It Out!

(a) Yes, each person would get $\frac{1}{2}$ l/500 ml.
(b) Pour 250 ml three times into the 1 litre container.
(c) Fill the 3 litre container and pour into the 5 litre container. Refill the 3 litre container and pour into the 5 litre container until it is full. Empty the contents of the 5 litre container. Pour the 1 litre left in the 3 litre container into the 5 litre container. Fill the 3 litre container and pour into the 5 litre container to get 4 litres.
(d) Fill the 5 litre container with water and pour it into the 8 litre container. Fill the 5 litre container.

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1.

(a)	True	**(g)**	True
(b)	False	**(h)**	False
(c)	False	**(i)**	True
(d)	False	**(j)**	True
(e)	True	**(k)**	False
(f)	False	**(l)**	True

3. **(a)** 21 = (3 × 7) True
(b) 3 × 4 = 36 ÷ 6 False
(c) 70 + 11 = 90 – 9 True
(d) 40 – 14 = 18 + 6 False
(e) 51 ÷ 3 = 2 + (5 × 3) True

4.

(a)	True	**(g)**	True
(b)	True	**(h)**	False
(c)	True	**(i)**	False
(d)	True	**(j)**	True
(e)	False	**(k)**	False
(f)	True	**(l)**	False

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5. **(a)** (243 + 145) ÷ 2 = 194 = (vi) 250 – 56
(b) 248 – 61 – 37 = 150 = (v) 25 × 6
(c) 480 + 130 = 610 = (iv) 700 – 90
(d) 288 ÷ 3 = 96 = (i) 12 × 8
(e) 100 – 31 × 3 = 7 = (ii) (130 – 46) ÷ 12
(f) 20 × 20 = 400 = (iii) 800 ÷ 2
(g) 56 ÷ 7 × 8 = 64 = (viii) 0.64 × 100
(h) 120 + 35 = 155 = (xi) 31 × 5
(i) 48 + 13 × 5 = 113 = (x) 155 – 6 × 7
(j) 460 – 69 ÷ 3 = 437 = (xii) 238 + 199
(k) 95 – 38 + 58 = 115 = (vii) 460 ÷ 4
(l) 21 × 3 × 2 = 126 = (ix) 7 × 9 × 2

7. (a) 6,000
(b) 5.2
(c) 63,000
(d) 3.6
(e) 280
(f) 0.72
(g) 4
(h) 9

Work It Out!
(a) (i) 12 × 28 = 16 × 21
(ii) 26 + 36 = 197 − 135
(iii) (4 − 2) × 3 = 36 ÷ 6
(iv) 4 + 48 ÷ 24 = 12 − 6
(b) (i) 13 + (12 × 5) + (9 × 8)

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Work It Out!
(a) (a) 10
(b) 6
(e) 7
(g) 8
(h) 2
(b) (c) 7
(d) 5
(f) 4
(i) 44

2. (a) False
(b) True
(c) False
(d) True
(e) True
(f) True
(g) False
(h) True
(i) False
(j) False
(k) True
(l) True
(m) False
(n) False
(o) True
(p) False
(q) False
(r) True
(s) False
(t) True
(u) False
(v) False
(w) True
(x) False

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3. (a) >
(b) =
(c) >
(d) =
(e) <
(f) >
(g) >
(h) <
(i) >

4. (a) 86
(b) 77
(c) 53
(d) 211
(e) 141
(f) 376
(g) 66
(h) 181
(i) 99

5. (a) 111
(b) 511
(c) 110
(d) 581
(e) 181
(f) 54
(g) 266
(h) 38
(i) 111

Work It Out!
(a) 17
(b) 1.024 kg
(c) €7,661
(d) €4,500
(e) 15 secs
(f) (i) €236
(ii) €677
(g) (i) €235.01
(ii) €677.99

PAGE 179

1. (a) 76 + 27 = 103; 84 + 27 = 111; 115 + 27 = 142
(b) 24 × 5 = 120; 31 × 5 = 155; 34 × 5 = 170
(c) 93 ÷ 3 = 31; 120 ÷ 3 = 40; 159 ÷ 3 = 53
(d) 130 − 59 = 71; 116 − 59 = 57; 122 − 59 = 63

2. (a) 4 × 7 − 1 = 27; 10 × 7 − 1 = 69; 7 × 7 − 1 = 48
(b) 7 × 5 + 3 = 38; 8 × 5 + 3 = 43; 13 × 5 + 3 = 68
(c) (24 + 3) ÷ 3 = 9; (21 + 3) ÷ 3 = 8; (9 + 3) ÷ 3 = 4
(d) (16 ÷ 8) − 2 = 0; (64 ÷ 8) − 2 = 6; (72 ÷ 8) − 2 = 7

PAGE 180

3. (a) input + 27 = output
(b) input × 5 = output
(c) input ÷ 3 = output
(d) input − 59 = output
(a) input × 7 − 1 = output
(b) input × 5 + 3 = output
(c) (input + 3) ÷ 3 = output
(d) (input ÷ 8) − 2 = output

Work It Out!
(a) (i) Boxes × 25 = Crayons;
(ii) 25
(iii) 175
(iv) 4
(b) (i) (Tip − €10) ÷ 3 = Jr waiters tip
(ii) €10
(iii) €9
(iv) €34
(v) €43

Work It Out!
7 at the red table and 5 at the blue table

PAGE 181

1. (a) 568
(b) 600
(c) 8.7
(d) 6
(e) €4.40
(f) 8 weeks
(g) 0.664 km

2. (a) 361
(b) 684
(c) 66
(d) 10
(e) 278
(f) 527
(g) 11
(h) 21
(i) 47
(j) 43
(k) 74
(l) 16

PAGE 182

1. (a) head; tail
(b) head and tail; 2 heads; 2 tails
(c) 2 heads and 1 tail; head and 2 tails; 3 heads; 3 tails

3. (e) (i) 10 chances in 30 or $\frac{1}{3}$ because there are only 3 possible results and there is an equal chance of any of the 3 results.
(ii) 1 in 4; the chance of getting two tails is the same as getting two heads
(iii) 1 in 2; Out of the four possible outcomes (head head, head tail, tail tail, tail head), two give both head and tail so the chance is two in four tosses.

PAGE 183

1. (a) (i) 1 chance in 4
(ii) 1 chance in 4
(iii) 2 chances in 4
(b) When the two coins are tossed together there is a higher chance of getting a heads/tails combination because the result could be heads/tails or tails/heads.

There is only one chance of getting heads/heads or tails/tails.

2. **(a)** 1 chance in 4
(b) 1 chance in 4
(c) 2 chances in 4
(d) 1 chance in 4
(e) 1 chance in 4

3. **(a)** 1 chance in 8
(b) 3 chances in 8
(c) 3 chances in 8

5. **(a)** 1, 3, 5
(b) 1 chance in 6
(c) 5 chances in 6
(d) 1 chance in 2
(e) 1 chance in 2

PAGE 184

6. **(a)** **(i)** 1 chance in 4
(ii) 1 chance in 4
(iii) 1 chance in 2

PAGE 185

1. **(a)** Equal chance of both colours
(b) No chance
(c) 5

2. **(a)** White
(b) 1 in 4
(c) 3 in 4
(d) 8 white and 2 blue or 7 white and 3 blue

3. **(a)** 1 chance in 6 $\left(\frac{1}{6}\right)$
(b) 3 chances in 6 $\left(\frac{3}{6} \text{ or } \frac{1}{2}\right)$
(c) 2 chances in 6 $\left(\frac{2}{6} \text{ or } \frac{1}{3}\right)$

PAGE 186

1. **(a)** 1 in 4
(b) No chance
(c) No
(d) No
(e) No
(f) Yes
(g) 25 blue, 25 red, 25 green, 25 yellow

3. **(a)** 12
(b) **(i)** 5
(ii) 4
(iii) 2
(iv) 1
(c) **(i)** $\frac{5}{12}$
(ii) $\frac{1}{12}$
(iii) $\frac{2}{12}$ or $\frac{1}{6}$
(iv) $\frac{4}{12}$ or $\frac{1}{3}$
(d) No
(e) Green
(f) Yellow

PAGE 187

1. **(a)** 13
(b) 1 chance in 13
(c) 1 chance in 13
(d) 4 chances in 13
(e) 9 chances in 13
(f) 5 chances in 13
(g) 4 chances in 13

1. **(a)** 15 in 40 or 3 in 8
(b) 4 in 40 or 1 in 10
(c) 10 in 40 or 1 in 4
(d) No chance
(e) 3 in 40
(f) No, because only 40 children were surveyed it is not a fair representation. If 500 or 1000 children were surveyed it would have a better chance of being fair.
(g) No. The number of children surveyed is too small.

PAGE 188

1. **(a)** Pie chart
(b) **(i)** Soccer
(ii) Swimming and Tennis
(c) 65%
(d) Soccer: $\frac{1}{4}$, 0.25
Gaelic Games: $\frac{1}{5}$, 0.2
Rugby: $\frac{3}{20}$, 0.15
Tennis: $\frac{1}{20}$, 0.05
Swimming: $\frac{1}{20}$, 0.05
(e) **(i)** 250
(ii) 150
(iii) 200
(iv) 50

2. **(a)** Croke Park: 82,300
Semple Stadium: 53,000
Aviva Stadium: 51,700
Páirc Uí Chaoimh: 43,550
McHale Park: 38,000
Thomond Park: 25,600
Tolka Park: 9,860
(b) Croke Park: 82,000
Semple Stadium: 53,000
Aviva Stadium: 52,000
Páirc Uí Chaoimh: 44,000
McHale Park: 38,000
Thomond Park: 26,000
Tolka Park: 10,000
(c) **(i)** eighty-two thousand, three hundred; 80,000 + 2,000 + 300
(ii) nine thousand, eight hundred and sixty; 9,000 + 800 + 60
(d) 72,440
(e) 6
(f) 74,070
(g) 5,120

PAGE 189

3. **(a)** A: centre point,
B: circumference,
C: diameter,
D: arc,
E: radius
(b) F: acute,
G: obtuse,
H: straight,
I: right,
J: reflex
(c) 18.2 m
(d) G = 135°,
H = 180°,
I = 90°,
J = 270°
(e) 16 m and 40 m
(f) 640 m² and 113.2 m
(g) 3.15 kg
(h) 495 g

4. **(a)** 6
(b) **(i)** 16
(ii) $\frac{1}{3}$
(c) **(i)** 2 in 3
(ii) 1 in 3
(d) −3

5. **(a)** Aviva:
Area = 7,208 m²,
Perimeter = 348 m
Croke Park:
Area = 12,384 m²,
Perimeter = 460 m
(b) 5,176 m²
(c) **(i)** Quarter to four in the afternoon
(ii) 14:25
(d) 17:15

Discovery Book

PAGE 1

2. **(b)** **(i)** greater
(ii) smaller
(iii) word

PAGE 3

1. **(a)** 67,000 68,000 69,000 70,000 71,000
(b) 34,200 34,300... 34,800 34,900 35,000
(c) 21,210 21,220 21,230 21,240.... 21,290
(d) 50,049 51,049 52,049 53,049.... 58,049
(e) 81,835 81,935 82,035...82,535 82,635
(f) 95,994 96,004.... 96,054 96,064 96,074

2. **(a)** 15,170
(b) 12,820
(c) 24,700
(d) 73,910
(e) 86,150
(f) 39,640

3. **(a)** 25,600
(b) 37,300
(c) 96,700
(d) 54,300
(e) 64,000
(f) 48,000

4. **(a)** 12,000
(b) 15,000
(c) 29,000
(d) 51,000
(e) 99,000
(f) 77,000

PAGE 4

1. **(a)** S: $\frac{3}{1000}$ or 0.003
US: $\frac{997}{1000}$ or 0.997
(b) S: $\frac{27}{1000}$ or 0.027
US: $\frac{973}{1000}$ or 0.973
(c) S: $\frac{89}{1000}$ or 0.089
US: $\frac{911}{1000}$ or 0.911
(d) S: $\frac{463}{1000}$ or 0.463
US: $\frac{537}{1000}$ or 0.537
(e) S: $\frac{247}{1000}$ or 0.247
US: $\frac{753}{1000}$ or 0.753
(f) S: $\frac{842}{1000}$ or 0.842
US: $\frac{158}{1000}$ or 0.158

2. **(i)** $\frac{842}{1000}$ or 0.842
(ii) $\frac{997}{1000}$ or 0.997

3. **(i)** $\frac{3}{1000}$ or 0.003
(ii) $\frac{158}{1000}$ or 0.158

4. **(a)** $\frac{1}{2}$, $\frac{500}{1000}$, 0.5
(b) $\frac{1}{4}$, $\frac{250}{1000}$, 0.25
(c) $\frac{3}{4}$, $\frac{750}{1000}$, 0.75

PAGE 5

1. **(a)** 6.3, 6.4, 6.5, 6.6., 6.7, 6.8, 6.9
(b) 6.33, 6.35, 6.36., 6.37, 6.38, 6.39
(c) 83.3, 83.4, 83.5, 83.6, 83.7, 83.8, 83.9
(d) 83.43, 83.44, 83.45, 83.46, 83.47, 83.48, 83.49

PAGE 6

2. **(a)** 3
(b) 7
(c) 9
(d) 6
(e) 9
(f) 3
(g) 4
(h) 12
(i) 7
(j) 22
(k) 1
(l) 48

1. **(a)** **(i)** 36,000 km
(ii) 60,000 km
(b) **(i)** 89.146
(ii) 86.946

PAGE 7

Learning Log
I can put numbers in order
(a) 73,177, 73,117, 31,771
(b) 0.234, 0.431, 1.423, 4.213
I can identify the value of each digit in a number
(a) 2 thousands, 2,000
(b) 7 thousandths, 0.007
I can problem-solve using charts and grids
(a) 28,000
(b) May

PAGE 8

3.

(a)
(b)
(c)
(d)
(e)
(f)
(g)
(h)

PAGE 9

1. **(a)** Acute, < 90°
(b) Right angle, = 90°
(c) Obtuse, > 90°
(d) Straight line, > 90°
(e) Obtuse, > 90°
(f) Full rotation, > 90°

1. **(a)** 60°
(b) 90°
(c) 135°
(d) 120°

2. **(a)** A = acute
B = obtuse
C = right
D = reflex
E = acute
F = obtuse
G = reflex
H = right
(c) A = 30°
B = 120°
C = 90°
D = 300°
E = 60°
F = 160°
G = 250°
H = 90°

PAGE 10

1. **(a)** A = 25°
(b) A = 47°
(c) A = 162°

Learning Log
I can identify acute, obtuse and reflex angles.
(a) Acute
(b) Reflex
(c) Right
(d) Obtuse
I can measure an angle using a protractor.
(a) 35°
(b) 170°
I can calculate the missing angle in a triangle without using a protractor.
A = 30°, B = 105°

PAGE 11

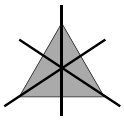
2.

Shape	Sides	Angles	Right angles	Acute angles	Obtuse angles	Parallel lines	Can Tessellate	Name
	4	4	4	0	0	2 pairs	Yes	Rectangle
	3	3	0	3	0	0	Yes	Equilateral triangle
	3	3	1	2	0	0	Yes	Scalene right-angled triangle
	3	3	0	2	1	0	Yes	Scalene triangle
	4	4	0	2	2	2 pairs	Yes	Parallelo-gram
	4	4	0	2	2	2 pairs	Yes	Rhombus

Shape	Sides	Angles	Right angles	Acute angles	Obtuse angles	Parallel lines	Can Tessellate	Name
	5	5	0	0	5	0	No	Regular pentagon
	5	5	0	3	1 and 1 reflex	0	No	Irregular pentagon
	8	8	0	0	8	4 pairs	No	Regular octagon

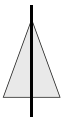
PAGE 12

1. (a)



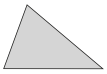
Equilateral triangle

(b)



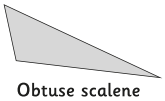
Isosceles triangle

(c)



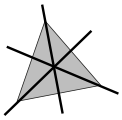
Acute scalene triangle

(d)



Obtuse scalene triangle

(e)



Equilateral triangle

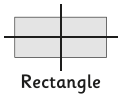
(f)

Right-angled scalene triangle

3. Equilateral triangle; obtuse scalene triangle; equilateral, isosceles or scalene triangle; right-angled isosceles triangle

PAGE 13

1. (a)



Rectangle

(b)

Parallelogram

(c)

Square

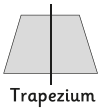
(d)

Irregular quadrilateral

(e)

Parallelogram

(f)



Trapezium

3. Scalene trapezium; isosceles trapezium; parallelogram

PAGE 14

Learning Log

I can describe and classify polygons by their lines and angles.

(a) angles
(b) lines
(c) three, straight
(d) three, sides
(e) four, sides
(f) one pair, parallel

I can use 2-D shapes and their properties to solve problems.

(a) scalene
(b) opposite
(c) three
(d) isosceles
(e) scalene
(f) equilateral/acute
(g) equilateral/acute

I can classify 2-D shapes according to their lines of symmetry.

(a) three, four
(b) one
(c) no/zero

PAGE 15

3. (a) estimate
(b) sum, total
(c) difference
(d) minuend
(e) subtrahend

4. Addition phrases (yelllow): sum of, total, and, altogether, more, how many .... between Subtraction phrases (pink): difference, how much .... greater than, left, rest, fewer, more than

PAGE 16

1. (a) 1.8
(b) 2.6
(c) 1.7
(d) 1.8
(e) 1.6
(f) 2.6
(g) 0.18
(h) 0.2
(i) 0.17
(j) 0.26
(k) 0.28
(l) 0.24
(m) 2.4
(n) 3.4
(o) 2.8
(p) 4.2
(q) 4.2
(r) 2.5

2. (a) 7.86
(b) 8.09
(c) 7.68
(d) 8.96
(e) 9.4
(f) 8.92

PAGE 17

1. (a) 1,000 + 2,000 = 3,000
1,000 + 3,000 = 4,000
3,822

(b) 60,000 + 20,000 = 80,000
60,000 + 20,000 = 80,000
88,805

(c) 20,000 + 50,000 = 70,000
20,000 + 50,000 = 70,000
78,333

(d) 6,000 – 1,000 = 5,000
6,000 – 1,000 = 5,000
4,842

(e) 60,000 – 20,000 = 40,000
70,000 – 20,000 = 50,000
42,488

(f) 80,000 – 50,000 = 30,000
80,000 – 60,000 = 20,000
24,835

(g) 20 + 30 = 50
30 + 30 = 60
59.9

(h) 40 + 50 = 90
50 + 60 = 110
106.202

(i) 60 – 40 = 20
60 – 50 = 10
15.79

(j) 80 – 20 = 60
80 – 20 = 60
62.864

1. (a) 11,249, 20,249, 21,149, 21,239, 21,259, 21,349, 22,249, 31,249

(b) 32,468, 41,468, 42,368, 42,458, 42,478, 42,568, 43,468, 52,468

(c) 43,137, 52,137, 53,037, 53,127, 53,147, 53,237, 54,137, 63,137

(d) 75,356, 84,356, 85,256, 85,346, 85,366, 85,456, 86,356, 95,356

(e) 64,976, 73,976, 74,876, 74,966, 74,986, 75,076, 75,976, 84,976

(f) 26,008, 35,008, 35,908, 35,998, 36,018, 36,108, 37,008, 46,008

(g) 57,991, 66,991, 67,891, 67,981, 68,001, 68,091, 68,991, 77,991

2. (a) 2.648, 3.548, 3.638, 3.647, 3.649, 3.658, 3.748, 4.648

(b) 4.149, 5.049, 5.139, 5.148, 5.150, 5.159, 5.249, 6.149

(c) 3.547, 4.447, 4.537, 4.546, 4.548, 4.557, 4.647, 5.547

(d) 1.169, 2.069, 2.159, 2.168, 2.17, 2.179, 2.269, 3.169

(e) 2.081, 2.981, 3.071, 3.08, 3.082, 3.091, 3.181, 4.081

(f) 7.909, 8.809, 8.899, 8.908, 8.91, 8.919, 9.009, 9.909
(g) 6.001, 6.901, 6.991, 7, 7.002, 7.011, 7.101, 8.001

PAGE 18

1. 14.038 km
2. 9,250
3. 18,725
4. 4,500
5. 32,054

PAGE 19

Learning Log

I can understand and use the associative property of addition.
(a) 1.4
(b) 3.2
(c) 3.3

I can add and subtract using doubles and near doubles.
(a) 0.032
(b) 29,000
(c) 0.22

I can add and subtract in stages.
(a) 67,183
(b) 29,569
(c) 15.89

I can use the column method for addition and subtraction.
(a) 92,441 **(c)** 6.316
(b) 38,373 **(d)** 3.185

I can subtract using constant difference.
(a) 15,241
(b) 4.009
(c) 345

I can solve problems using bar models and number lines.
14,038

PAGE 20

2. **(a)** 24 **(d)** 60
(b) 60 **(e)** 7
(c) 52 **(f)** 12
(g) 365 or 366
(h) 366
(i) 31
(j) February
(k) 30
(l) Any of these: September; April; June; November
(m) Summer
(n) Spring

3. **(a)** Minutes
(b) Seconds
(c) Weeks or days
(d) Minutes
(e) Seconds or minutes
(f) Hours
(g) Minutes

1. **(a)** 186 mins
(b) 3 hrs 53 mins
(c) 455 mins
(d) 18 hrs 56 mins
(e) 718 mins
(f) 16 hrs 50 mins

PAGE 21

3. **(a)** 04:25 **(e)** 19:28
(b) 13:07 **(f)** 22:43
(c) 17:40 **(g)** 15:00
(d) 10:55 **(h)** 23:55

4.

12-hr clock	24-hr clock
4 a.m.	04:00
3:35 p.m.	15:35
6:24 p.m.	18:24
6:23 p.m.	18:23
10:55 p.m.	22:55
11:46 p.m.	23:46
11:05 a.m.	11:05
1:13 p.m.	13:13

PAGE 22

1. **(a)**

Day	Starting time	Finishing time
Monday	7:35 a.m.	14:15 or 2:15 p.m.
Tuesday	9:50 or 9:50 a.m.	16:30
Wednesday	04:46 or 4:46 a.m.	11:26 a.m.
Thursday	06:30	13:10 or 1:10 p.m.
Friday	17:05 or 5:05 p.m.	11:45 p.m.
Saturday	10:38 a.m.	17:18 or 5:18 p.m.

2.

Time	Programme	Length
3:30–4:05	Pop Music	35 mins
4:05–4:09	Advertisements	4 mins
4:09–5:05	The Farming Show	56 mins
5:05–5:10	Advertisements	5 mins
5:10–6:00	Drive Time	50 mins
6:00–6:03	Advertisements	3 mins
6:03–6:25	Early News	22 mins
6:25–6:30	Weather Forecast	5 mins
6:30–6:33	Advertisements	3 mins
6:33–7:15	Current Affairs	42 mins
7:15–8:04	Classical Music	49 mins
8:04–8:10	Advertisements	6 mins
8:10–8:56	C & W Music	46 mins
8:56–9:00	Advertisements	4 mins
9:00–9:24	Late News	24 mins
9:24–10:12	The Book Show	48 mins
10:12–10:15	Advertisements	3 mins

3. **(b)** 28 mins
(c) 130 mins or 2 hrs 10 mins
(d) The farming show
(e) 6 hrs 45 mins

4. (not counting advertisements as programmes)
(a) 15:30
(c) 16:09
(e) 17:10
(g) 18:03
(h) 18:25
(j) 18:33
(k) 19:15
(m) 20:10
(o) 21:00
(p) 21:24

PAGE 23

Learning Log

I can add and subtract hours and minutes.
(a) 7 hrs 10 mins
(b) 49 mins
(c) 8 hrs 21 mins

I can multiply hours and minutes.
(a) 17 hrs 00 mins
(b) 62 hrs 15 mins
(c) 27 hrs 54 mins

I can read and interpret the 24-hour clock.
(a) 3:45 a.m.
(b) 17:40

I can convert between 12-hour and 24-hour format.
(a) 7:47 p.m.
(b) 16:57

PAGE 24

3. **(a)** multiplication
(b) factors; product; commutative
(c) inverse
(d) dividend; divisor; quotient
(e) remainder

PAGE 25

4. Multiplication phrases (orange): times, times greater than, product, ('s' to indicate looking for multiples; usually have a number followed by plural noun), e.g. packets, rows, groups
Division phrases (green): shared equally, each, how many can be filled

from, each took, how many groups of

5. Addition phrases (yellow): altogether
Subtraction phrases (pink): each took, how many left over, what must be added to, how much greater than

PAGE 26

1. ● 670, 67, 6,700, 67, 67,000, 67
   ● 1.23, 1.23, 123, 1.23, 1,230, 1.23
   (a) left
   (b) two places to the left
   (c) three places to the left
1. **(a)** 8 × 60 = 480
   (b) 5 × 20 = 100
   (c) 6 × 70 = 420
   (d) 7 × 90 = 630
   (e) 3 × 600 = 1,800
   (f) 4 × 200 = 800
   (g) 6 × 500 = 3,000
   (h) 3 × 900 = 2,700
   (i) 7 × 7,000 = 49,000
   (j) 4 × 7,000 = 28,000
   (k) 5 × 9,000 = 45,000
   (l) 8 × 5,000 = 40,000
   (m) 8 × 6 = 48
   (n) 5 × 4 = 20
   (o) 6 × 9 = 54
   (p) 7 × 7 = 49
2. **(a)** 20 × 50 = 1,000
   (b) 40 × 50 = 2,000
   (c) 30 × 60 = 1,800
   (d) 60 × 100 = 6,000
   (e) 10 × 600 = 6,000
   (f) 20 × 200 = 4,000
   (g) 20 × 600 = 12,000
   (h) 20 × 300 = 6,000
   (i) 40 × 200 = 8,000
   (j) 50 × 200 = 10,000
   (k) 50 × 200 = 10,000
   (l) 40 × 300 = 12,000
   (m) 30 × 300 = 9,000
   (n) 10 × 4 = 40
   (o) 20 × 5 = 100
   (p) 40 × 9 = 360
3. **(a)** 14T ÷ 7 = 2T = 20
   (b) 24T ÷ 8 = 3T = 30
   (c) 27T ÷ 9 = 3T = 30
   (d) 25T ÷ 5 = 5T = 50
   (e) 16T ÷ 4 = 4T = 40
   (f) 30T ÷ 6 = 5T = 50
   (g) 21T ÷ 7 = 3T = 30
   (h) 24T ÷ 8 = 3T = 30
   (i) 45T ÷ 9 = 5T = 50

PAGE 27

1. 37 km
2. 2,250
3. 59 kg
4. 537
5. 8.54

PAGE 28

Learning Log

I can multiply and divide with 10, 100, 1,000 and their multiples.
(a) 0.023
(b) 0.054
(c) 7,200
(d) 42,000
(e) 80
(f) 60

I can use thinking strategies to multiply.
(a) 70
(b) 320
(c) 120
(d) 92

I can multiply a whole number or a decimal number.
(a) 4.96
(b) 126,304
(c) 10.534

I can divide a decimal number.
(a) 0.87
(b) 3.2
(c) 0.45

I can solve word problems using a variety of strategies.
(a) 0.69
(b) 14,148

PAGE 29

1. **(a)** CD = diameter
   OA = radius
   AB = diameter
   OB = radius
   EO = radius
   AF = arc
   (b) GX = radius
   XJ = radius
   XI = radius
   IL = arc
   KX = radius
   IJ = diameter
   (c) MO = radius
   ON = diameter
   SO = arc
   PQ = diameter
   MP = radius
   RM = radius

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1. **(b)** A
   (i) Radius = 2 cm
   (ii) Diameter = 4 cm
   (iii) Area = 12 cm²
   B
   (i) Radius = 3 cm
   (ii) Diameter = 6 cm
   (iii) Area = 32 cm²
   C
   (i) Radius = 1.5 cm
   (ii) Diameter = 3 cm
   (iii) Area = 4 cm²
2. ● Whole $\left(\frac{1}{1}\right)$, 360°,
   ● Fifth $\left(\frac{1}{5}\right)$, 72°
   ● Half $\left(\frac{1}{2}\right)$, 180°,
   ● Sixth $\left(\frac{1}{6}\right)$, 60°
   ● Quarter $\left(\frac{1}{4}\right)$, 90°,
   ● Eighth $\left(\frac{1}{8}\right)$, 45°
   ● Third $\left(\frac{1}{3}\right)$, 120°,
   ● Ninth $\left(\frac{1}{9}\right)$, 40°

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3. **(a)** True
   (b) False
   (c) False
   (d) False
   (e) True
   (f) True
   (g) True
   (h) False
   (i) False

PAGE 32

2. **(a)** €2, €1, 20c, 10c, 5c, 1c; 0 notes; 6 coins
   (b) €1, 50c, 2c, 1c; 0 notes; 4 coins
   (c) €5, €1, 50c, 5c, 2c, 1c; 1 note; 5 coins
   (d) €10, €2, 50c, 10c, 5c; 1 note; 4 coins
   (e) €20, €2, €2, 50c, 20c, 10c, 5c, 2c, 2c; 1 note; 8 coins
   (f) €100, €50, €5, €1, 5c, 2c; 3 notes; 3 coins
   (g) €500, €100, €50, €20, €5, 50c, 20c, 20c, 5c, 2c, 2c; 5 notes; 6 coins
   (h) €500, €500, €100,€20, €5, €2, €1, 20c, 2c, 1c; 5 notes; 5 coins
1. **(a)** One pot costs €2.25; 5 pots cost €11.25

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2. **(a)** 31c
   (b) €2.94
   (c) 1 kg = €4.50; 4 kg = €18.00; 0.5 kg = €2.25; 4.5 kg = €20.25
   (d) 5-pack = €15.75; 1 bottle = €3.15; 3-pack = €9.45
3. **(a)** 3
   (c) €4.35

4. **(a)** 10
(c) €14.50
(d) 0.5 kg = €1.45;
1kg = €2.90;
5kg = €14.50

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Learning Log

I can add and subtract amounts of money.

Subtract €1.30 from €2.50. Add this answer to €4.34.

€2.50 − €1.30	€1.20 + €4.34
€2.50	€1.20
− €1.30	+ € 4.34
€1.20	€5.54

I can use the unitary method.

(a) one; multiply my answer by seven
(b) 1 bicycle = €205;
7 bicycles = €1,435
(c) 1 bag = €13.00;
4 bags = €52
Five bags of coal: €65
(d) **(i)** €2.40 ÷ 2 = €1.20;
€3.40 ÷ 3 = €1.13
Best value is 3 litres
(ii) €12 ÷ 5 = €2.40;
€7.50 ÷ 3 = €2.50
Best value is 5kg
(iii) €4 ÷ 5 = €0.80;
€10 ÷ 12 = €0.83
Best value is 5 bags
(iv) €2.85 ÷ 3 = €0.95;
€4.50 ÷ 5 = €0.90
Best value is 5 packs
(v) €4.60 ÷ 2 = €2.30;
€11 ÷ 5 = €2.20
Best value is 5 pots
(e) ...aren't always the best value for money.

PAGE 35

2. Whole
Fraction
Half
Quarter
Twelfth
Numerator
Denominator,
Equivalent fractions
Simplest form
Mixed number
Improper fraction

PAGE 36

2. **(a)** $\frac{2}{4}=\frac{1}{2}$
(b) $\frac{6}{6}=1$
(d) $\frac{2}{6}=\frac{1}{3}$

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6. **(a)** 1 whole $=\frac{2}{2}=\frac{3}{3}$
$=\frac{4}{4}=\frac{5}{5}=\frac{6}{6}=\frac{7}{7}=\frac{8}{8}$
$=\frac{9}{9}=\frac{10}{10}=\frac{11}{11}=\frac{12}{12}$
(b) $\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{4}{8}=\frac{5}{10}$
$=\frac{6}{12}$
(c) $\frac{1}{4}=\frac{2}{8}=\frac{3}{12}$
(d) $\frac{3}{4}=\frac{6}{8}=\frac{9}{12}$
(e) $\frac{1}{3}=\frac{2}{6}=\frac{3}{9}=\frac{4}{12}$
(f) $\frac{2}{3}=\frac{4}{6}=\frac{6}{9}=\frac{8}{12}$
(g) $\frac{1}{6}=\frac{2}{12}$
(h) $\frac{1}{5}=\frac{2}{10}$
(i) $\frac{2}{5}=\frac{4}{10}$
(j) $\frac{5}{6}=\frac{10}{12}$
(k) $\frac{3}{5}=\frac{6}{10}$

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1. **(a)** 16
(b) 8
(c) 6
(d) 9
(e) 15
(f) 12
(g) 4
(h) 27

2. **(a)** $\frac{1}{4}$
(b) $\frac{2}{4}=\frac{1}{2}$
(c) $\frac{3}{4}$

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3. **(a)** <
(b) =
(c) >
(d) <
(e) >
(f) =

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1. 168
2. 246
3. 45
4. 204
5. 378; 294

PAGE 42

Learning Log

I can identify fractions and equivalent fractions.

(a) **(i)** $\frac{3}{4}$ **(ii)** $\frac{1}{4}$
(b) **(i)** $\frac{2}{3}$ **(ii)** $\frac{1}{3}$
(c) **(i)** $\frac{1}{5}$ **(ii)** $\frac{4}{5}$

I can express fractions as part of a set or a number.

(a) $\frac{3}{10}$
(b) $\frac{1}{2}$
(c) $\frac{1}{5}$
(d) $\frac{4}{5}$

I can compare and order fractions.

(a) $\frac{5}{6}, \frac{7}{8}, \frac{8}{9}$
(b) $\frac{2}{12}, \frac{1}{3}, \frac{2}{2}$
(c) $\frac{2}{3}, \frac{9}{10}, \frac{11}{12}$
(d) $\frac{5}{10}, \frac{8}{12}, \frac{6}{8}$

I can calculate a fraction of a number.

(a) 20
(b) 117
(c) 94

I can calculate a number, given a fraction of the number.

(a) 170
(b) 87
(c) 150

I can multiply a fraction by a whole number.

(a) $2\frac{2}{9}$
(b) $\frac{7}{9}$
(c) $\frac{24}{9}=2\frac{2}{3}$

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3.

Shape	Number of surfaces		Number of edges		Number of vertices	Name of shape
	Flat	Curved	Straight	Curved		
	6	0	12	0	8	Cube
	6	0	12	0	8	Cuboid/ Prism
	1	1	0	1	1	Cone
	0	1	0	0	0	Sphere
	2	1	0	2	0	Cylinder

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1.

Prism	Regular/ irregular	Number of faces	Number of edges	Number of vertices	2-D shape(s) of faces	Name of prism
	Regular	6	12	8	Rectangles	Cuboid
	Regular	6	12	8	Squares	Cube
	Irregular	7	15	10	Rectangles and pentagons	Irregular pentagonal prism
	Regular	8	18	12	Rectangles and hexagons	Regular hexagonal prism
	Irregular	5	9	6	Rectangles and triangles	Triangular prism

1.

Shape	Number of faces	Number of edges	Number of vertices	2-D shape(s) of its base	Name of pyramid
	5	8	5	Square	Square pyramid
	6	10	6	Pentagon	Pentagonal pyramid
	4	6	4	Triangle	Triangular pyramid
	9	16	9	Octagon	Octagonal pyramid
	7	12	7	Hexagon	Hexagonal pyramid

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1. **(a)** Triangular prism
(b) Triangular pyramid
(c) Irregular pentagonal prism
(d) Cube
(e) Square pyramid
(f) Cuboid

2.

Net	Number of triangles	Number of rectangles	Number of squares	Total number of faces	Number of vertices
(a)	2	3	0	5	6
(b)	4	0	0	4	4
(c)	0	5	0	7	10
(d)	0	0	6	6	8
(e)	4	0	1	5	5
(f)	0	6	0	6	8

3. **(a)** pentagonal pyramid
(b) vertex, apex
(c) one, one, one
(d) tetrahedron / triangular pyramid
(e) faces, edges
(f) faces
(g) net

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Learning Log

I can identify the properties of 3-D objects.

1. **(a)** A polyhedron is a 3-D object with a polygon for each face.
(b) A tetrahedron is a triangular-based pyramid which has four faces, which taper to a point called a vertex.
(c) A regular prism is a 3-D object that has two identical regular bases and its other faces are rectangles.
(d) A vertex is where two or more edges meet at a point.
(e) An edge is where two surfaces meet.
(f) A face is a flat surface.
(g) An apex is the point which the triangular sides of a pyramid taper towards (the highest point).
(h) A net is the plan of a 3-D object.

I can sort objects into groups based on their properties.

Group 1 (curved surfaces): sphere, cone, cylinder

Group 2 (flat surfaces): cube, triangular prism, tetrahedron, octagonal prism, hexagonal prism

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1.
- 2 ×: 26, 32, 38, 42, 50, 54, 64, 68, 76
- 4 ×: 52, 64, 76, 84, 100, 108, 128, 136, 152
- 5 ×: 65, 80, 95, 105, 125, 135, 160, 170, 190
- 8 ×: 104, 128, 152, 168, 200, 216, 256, 272, 304
- 10 ×: 130, 160, 190, 210, 250, 270, 320, 340, 380
- 20 ×: 260, 320, 380, 420, 500, 540, 640, 680, 760
- 40 ×: 520, 640, 760, 840, 1,000, 1,080, 1,280, 1,360, 1,520
- 50 ×: 650, 800, 950, 1,050, 1,250, 1,350, 1,600, 1,700, 1,900
- 80 ×: 1,040, 1,280, 1,520, 1,680, 2,000, 2,160, 2,560, 2,720, 3,040

2. **(a)** 40 **(b)** 20 **(c)** 20 **(d)** 8 **(e)** 50 **(f)** 4 **(g)** 8 **(h)** 8 **(i)** 5 **(j)** 5 **(k)** 5 **(l)** 5 **(m)** 10 **(n)** 40 **(o)** 20 **(p)** 40 **(q)** 20 **(r)** 50

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Learning Log

I can divide using multiples.

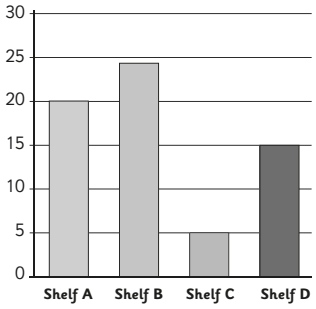
(a) 20 **(b)** 5 **(c)** 8 **(d)** 4

I can divide by a two-digit number.

(a) 4 R12
(b) 23 R23
(c) 30 R21
(d) 0.21

PAGE 49

1. **(a)** 15
(b) 24
(c)



2. **(a)** B
(b) C
(c) 9
(d) 14
(e) 64
(f) €42.25

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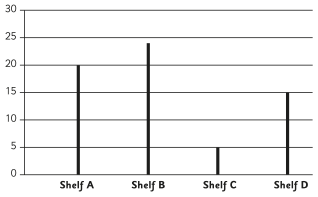
3.



4. **(a)**

	Shop A	Shop B	Total
1	23	25	48
2	41	28	69
3	15	20	35
4	19	12	31
5	34	14	48

	Shop A
1	𝍸 𝍸 𝍸 𝍸 |||
2	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |
3	𝍸 𝍸 𝍸
4	𝍸 𝍸 𝍸 ||||
5	𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 ||||

	Shop B
1	𝍸 𝍸 𝍸 𝍸 𝍸
2	𝍸 𝍸 𝍸 𝍸 𝍸 |||
3	𝍸 𝍸 𝍸 𝍸
4	𝍸 𝍸 ||
5	𝍸 𝍸 ||||

(b) 132
(c) 99
(d) Checkout 3
(e) Checkout 2
(f) 26.4
(g) 19.8
(h) 23.1
(i) Yes

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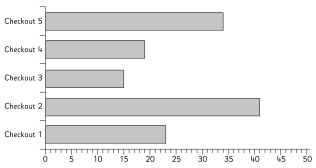
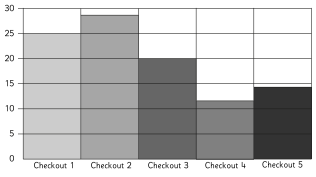
(j) 432
(k) €250.56

5. (a)



(b)



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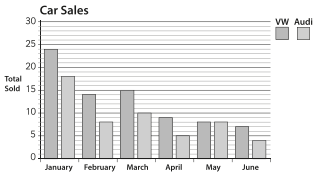
1.

Car	VW	Audi
January	24	18
February	14	8
March	15	10
April	9	5
May	8	8
June	7	4
Total	77	53



2. (a) 12.83
(b) 8.83
(c) January
(d) June
(e) 21.67
(f) 130
(g) €72,765
(h) €55,915
(i) VW

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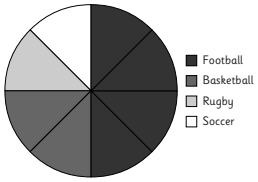
1.



2. (a) 2
(b) 140
(c) 200
(d) 160
(e) 220
(f) Seagulls
(g) Curlews
(h) 20

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3. (a) 48
(b) 6
(d) 2
(e) Tulips: 2 sections
Hyacinths: 2 sections
Bluebells: 3 sections
Snowdrops: 1 section

4. (a) 120
(b) 12
(c) Red: 2 sections
Green: 1 section
Yellow: 4 sections
Blue: 3 sections

5. (a) 72
(b) 6
(c) Beech: 1 section
Oak: 4 sections
Alder: 1 section
Ash: 2 sections
Sycamore: 3 sections
Willow: 1 section

6. (a) 160
(b) 8
(c) Horses: 1 section
Sheep: 5 sections
Lambs: 4 sections
Cows: 3 sections
Calves: 2 sections
Cattle: 3 sections
Ponies: 2 sections

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Learning Log

I can collect, organise and represent data using multiple bar charts.
(a) 4
(b) 10
(c) 32

I can solve practical tasks and solve problems using pie charts.
(a) 24
(b) 1
(c) Toffee: 6 sections
Jellies: 4 sections
Covered with chocolate: 3 sections
Nuts: 8 sections
Soft caramel centres: 3 sections

I can use data sets to solve problems.
(a) 30
(b) 90

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1. (a) $\frac{1}{4}; \frac{3}{4}; \frac{1}{3}; \frac{2}{5}$
(b) $\frac{2}{8}; \frac{6}{8}; \frac{2}{6}; \frac{4}{10}$
(c) $\frac{4}{16}; \frac{12}{16}; \frac{4}{12}; \frac{8}{20}$
(d) $\frac{1}{4} = \frac{2}{8} = \frac{4}{16}$;
$\frac{3}{4} = \frac{6}{8} = \frac{12}{16}$;
$\frac{1}{3} = \frac{2}{6} = \frac{4}{12}$;
$\frac{2}{5} = \frac{4}{10} = \frac{8}{20}$

2. (a) $\frac{1}{4}; \frac{3}{4}; \frac{2}{3}; \frac{3}{5}$
(b) $\frac{3}{12}; \frac{9}{12}; \frac{6}{9}; \frac{9}{15}$
(c) $\frac{6}{24}; \frac{18}{24}; \frac{12}{18}; \frac{18}{30}$
(d) $\frac{1}{4} = \frac{3}{12} = \frac{6}{24}$;
$\frac{3}{4} = \frac{9}{12} = \frac{18}{24}$;
$\frac{2}{3} = \frac{6}{9} = \frac{12}{18}$;
$\frac{3}{5} = \frac{9}{15} = \frac{18}{30}$

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1. (a) $\frac{1}{2}, \frac{50}{100}$, 0.5
(b) $\frac{1}{4}, \frac{25}{100}$, 0.25
(c) $\frac{3}{4}, \frac{75}{100}$, 0.75
(d) $\frac{1}{10}, \frac{10}{100}$, 0.1
(e) $\frac{3}{10}, \frac{30}{100}$, 0.3
(f) $\frac{7}{10}, \frac{70}{100}$, 0.7
(g) $\frac{1}{5}, \frac{20}{100}$, 0.2
(h) $\frac{2}{5}, \frac{40}{100}$, 0.4
(i) $\frac{3}{5}, \frac{60}{100}$, 0.6
(j) $\frac{1}{20}, \frac{5}{100}$, 0.05
(k) $\frac{7}{20}, \frac{35}{100}$, 0.35
(l) $\frac{9}{20}, \frac{45}{100}$, 0.45

2. (a) $\frac{1}{25}, \frac{4}{100}$, 0.04
(b) $\frac{1}{50}, \frac{2}{100}$, 0.02
(c) $\frac{1}{8}, \frac{12\frac{1}{2}}{100}$, or $\frac{125}{1000}$, 0.125
(d) $\frac{1}{3}, \frac{33\frac{1}{3}}{100}$, 0.33333 (recurring)

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2. (a) 50%
(b) 25%
(c) 75%
(d) 10%
(e) 30%
(f) 70%
(g) 20%
(h) 40%
(i) 60%
(j) 5%
(k) 35%
(l) 45%

4. (a) 24%
(b) 4%
(c) 43%
(d) 66%
(e) 5%
(f) 18%

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5. **(a)** 40%
(b) 50%
(c) 65%
(d) 25%

6. **(a)** 20%
(b) 90%
(c) 75%
(d) 85%
(e) 5%
(f) 65%
(g) 45%
(h) 60%
(i) 10%
(j) 45%
(k) 40%
(l) 30%

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1. **(a)** 40%
(b) **(i)** 60
(ii) 120
(iii) 300

2. **(a)** 40%
(b) **(i)** 40
(ii) 80
(iii) 200

3. **(a)** 20%
(b) **(i)** 20
(ii) 40
(iii) 100

4. **(a)** 24
(b) 56

5. **(a)** €50
(b) €20

6. 160

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1. €45
2. €320
3. €600
4. 375 g
5. 480 ml

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Learning Log

I can express tenths, hundredths and thousandths in both fractional and decimal form.

(a) 2.461
(b) 3.943

I can calculate equivalent fractions.

(a) $\frac{3}{9}$
(b) $\frac{35}{100}$
(c) $\frac{1}{4}$
(d) $\frac{1}{8}$
(e) $\frac{13}{20}$
(f) $\frac{6}{10}$

I can express percentages as decimals and fractions, and vice versa.

(a) 0.75 = 75%
(b) $\frac{14}{100}$ $\left(\text{or } \frac{7}{50}\right)$ = 14%
(c) $\frac{39}{100}$ = 39%

I can compare and order fractions, decimals and percentages.

(a) 0.34, 43%, $\frac{3}{4}$
(b) 45%, $\frac{4}{5}$, 0.81
(c) 7%, $\frac{7}{20}$, 0.7

I can calculate percentages of amounts.

(a) 39
(b) 23
(c) 128

I can solve problems involving percentage increase, decrease and discounts.

(a) 275 ml
(b) €122.50

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1. **(a)** 1000
(i) 600
(ii) 900
(b) 100, 1,000
(i) 25, 250
(ii) 80, 800
(c) 10
(i) 5 mm
(ii) 4 mm
(iii) 4 mm

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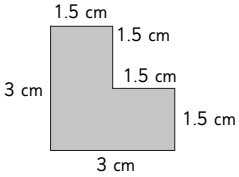
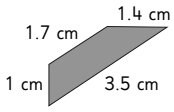
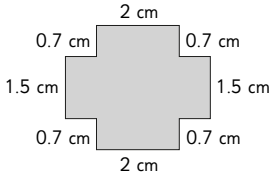
1. **(a)**



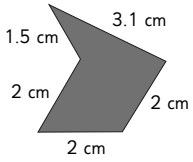
(b)



(c)



(d)



(a) (1.5, 1.5, 1.5, 1.5, 3, 3) = 12 cm
(b) (1.7, 1.4, 3.5, 1) = 7.6 cm
(c) (0.7 × 8, 1.5 × 2, 2 × 2) = 12.6 cm
(d) (3.1, 2, 2, 2, 1.5) = 10.6 cm

2. **(a)** No
(b) Yes
(c) No
(d) Yes
(e) No
(f) No
(g) No

3. **(a)** 2,100 m, 2 km 100 m, 2.1 km, $2\frac{100}{1000}$ km
(b) 3,800 m, 3 km 800 m, 3.8 km, $3\frac{800}{1000}$ km
(c) 1,055 m, 1 km 55 m, 1.055 km, $1\frac{55}{1000}$ km
(d) 5,045 m, 5 km 45 m, 5.045 km, $5\frac{45}{1000}$ km
(e) 4,008 m, 4 km 8 m, 4.008 km, $4\frac{8}{1000}$ km

4. **(a)** 50 mm = 5 cm
(b) 10 mm = 1 cm
(c) 55 mm = 5.5 cm
(d) 253 mm = 25.3 cm
(e) 147 mm = 14.7 cm
(f) 170 mm = 17 cm
(g) 210 mm = 21 cm
(h) 620 mm = 62 cm
(i) 18 mm = 1.8 cm

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Learning Log

I can measure length using appropriate metric units.

(a) 50 mm
(b) 43 mm
(c) 69 mm

I can convert centimetres to millimetres.

(a) 40 mm
(b) 130 mm
(c) 245 mm

I can convert millimetres to centimetres.

(a) 3 cm
(b) 27 cm
(c) 80.1 cm

I can select an appropriate measuring instrument.

(a) Postage stamp/match/finger nail
(b) Book/pencil case/pencil
(c) Classroom/person's height
(d) Corridor/path/pitch

I can measure perimeter.
(a) 26 cm
(b) 25.5 cm
I can solve problems involving length.
127.5 cm

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3. A = 1 cm^2
B = 6 cm^2
C = 16 cm^2
D = 7 cm^2
E = 5 cm^2
F = 9 cm^2
G = 8 cm^2

1.

Area	Length	Width	Perimeter
81 cm^2	9 cm	9 cm	36 cm
136 cm^2	17 cm	8 cm	50 cm
300 cm^2	25 cm	12 cm	74 cm
210 m^2	7 m	30 m	74 cm
7.8 cm^2	3 cm	2.6 cm	11.2 cm
46 m^2	9.2 m	5 m	28.4 m

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1. **(a)** 20.25 cm^2
(b) 21 cm^2
(c) 19.25 cm^2
2. **(a)** 60 cm^2
(b) 750 m^2
(c) 81 cm^2
(d) 115 m^2
(e) 120 cm^2
(f) 92 m^2
(g) 377 cm^2
(h) 254.7 m^2
3. **(a)** cm^2 **(e)** cm^2
(b) m^2 **(f)** cm^2
(c) m^2 **(g)** cm^2
(d) cm^2 **(h)** m^2
4. **(a)** space
(b) length and width
(c) cm^2 and m^2
(d) area, multiplying
(e) perimeter

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1. **(a)** 24.5 cm^2
(b) 39 cm^2
(c) 81 cm^2
(d) 152.5 cm^2
(e) 32 cm^2
(f) 36 cm^2

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Learning Log

I can find the area of compound shapes.
(a) **(i)** Multiplying the length by the width
(ii) Repeated addition
(iii) Counting the square units
(b) A: 40 cm^2
B: 81 cm^2
C: 37 cm^2
D: 54 cm^2
I can solve problems involving area.
36 m

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1. **(a)** doesn't, associative
(b) does
(c) double
(d) rough, front-end estimation, rounding
(e) minuend, subtrahend
2. **(a)** 1.1
(b) 4.6
(c) 2.8
(d) 57,872
(e) 19,046
(f) 1.842
(g) 130
(h) 745
(i) 49

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Learning Log

I can add and subtract using partitioning.
(a) 627
(b) 251
I can use compatible numbers and compensation to add and subtract.
(a) 2,662
(b) 24,147
I can add and subtract in stages (sequencing).
(a) 9,790
(b) 21,222
I can choose the best number line to show subtraction.
(a) 550
(b) 42,330
I can use empty number lines to represent and solve word problems.
(a) 335
(b) 13.4 kg

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1. **(b)** **(i)** 6
(ii) 6
(iii) 3
(iv) 5
(v) 4
(vi) 10
(vii) 8
(viii) 1
(ix) 7
(x) 9
(xi) 2
(xii) 9
2. **(a)** +9°
(b) −4°
(c) +2°
(d) 0°
(e) −2°
(f) −3°
3. **(a)** +2°
(b) −1°
(c) −8°
(d) −9°
(e) −10°
(f) −5°

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4. **(a)** −9, −8, −7, −5, −4, −3, +3, +4, +5, +6, +8, +10
(b) −18, −16, −14, −10, −8, −6, +6, +8, +10, +12, +16, +20
(c) −45, −40, −35, −30, −25, −20, +10, +15, +25, +30, +35, +40, +45
(d) −100, −80, −70, −60, −50, −40, −30, +20, +30, +40, +60, +70, +90, +100
7.
- 0, −1, −2, −3, −4, −5, −6
- −1, −2, −3, −4, −5, −6, −7, −8
- 2, 0, −2, −4, −6, −8, −10, −12
- −2, −4, −6, −8, −10, −12, −14, −16
- 5, 0, −5, −10, −15, −20, −25, −30
- 10, 0, −10, −20, −30, −40, −50, −60
- −8, −10, −12, −14, −16, −18, −20, −22
- −10, −8, −6, −4, −2, 0, 2, 4
- −13, −17, −21, −25, −29, −33, −37, −41

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Learning Log

I can use directed numbers to represent real-life situations.
1. **(a)** +8,848 m
(b) −36°C
(c) −€30
(d) −12 m
(e) −3
(f) +16°C
(g) −6
2. +8,848 m
3. −36°C
I can compare and order directed numbers.
1. **(a)** >
(b) =
(c) <
(d) >
(e) <
(f) >
(g) <
(h) <

2. **(a)** 6°C, –2°C, –9°C
(b) +82 m, +67 m, –95 m
(c) €64, –€19, –€34
(d) +42, –34, –35

I can solve problems involving directed numbers.
(a) –8°C
(b) 3°C
(c) 11°C
(d) January

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2. A= 750 g, B = 37 kg, C = 1.5 kg
3. **(a)** 300 g
(b) 5 g
(c) 65 kg
(d) 3 g
(e) 200 g
(f) 50 g
4. **(a)** $\frac{1}{2}$ kg
(b) $\frac{1}{10}$ kg
(c) $\frac{2}{5}$ kg
(d) $\frac{3}{4}$ kg
5. **(a)** 1,000 g
(b) 1,700 g
(c) 4,990 g
(d) 3,050 g
(e) 8,130 g
(f) 9,990 g
6. **(a)** 1 kg
(b) $6\frac{3}{4}$ kg
(c) 3 kg
(d) $5\frac{3}{10}$ kg
(e) $8\frac{1}{2}$ kg
(f) $9\frac{1}{5}$ kg
7. **(a)** 1 kg
(b) 3.8 kg
(c) 7.49 kg
(d) 8.02 kg
(e) 7.11 kg
(f) 9.08 kg

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1.

Object	Unit (kg or g)	Instrument of measurement
Flour (when baking a cake)	g	Kitchen scales
Pupil in 5th class	kg	Bathroom scales
Bunch of grapes	g	Supermarket/ kitchen scales
Packed suitcase	kg	Bathroom scales
Steak meat	kg	Supermarket scales
Flock of 6 sheep	kg	Weigh bridge
Bag of carrots	g/kg	Supermarket scales
Bag of coal	kg	Spring balance
Butter	g	Kitchen scales

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7. **(a)** 6,250 g
(b) kitchen
(c) scales
(d) weigh bridge
(e) kg
(f) equal

Learning Log

I can estimate and measure weight of an object using appropriate metric units.
(a) grams (g)
(b) kilograms (kg)

I can solve problems involving grams and kilograms.
4,752 g, 4.752 kg

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1. **(a)** Factors: 3, 5; Multiple: 15
(b) Factors: 7, 4; Multiple: 28
(c) Factors: 8, 1; Multiple: 8
(d) Factors: 9, 6; Multiple: 54
(e) Factors: 24, 6; Multiple: 144
(f) Factors: 30, 40; Multiple: 1,200
(g) Factors: 34, 56; Multiple: 1,904
(h) Factors: 124, 6; Multiple: 744
(i) Factors: 6, 9; Multiple: 54
(j) Factors: 9, 12; Multiple: 108
(k) Factors: 10, 34; Multiple: 340
(l) Factors: 8, 64; Multiple: 512

While strictly speaking (i)– (l) are division sentences, they can be written as inverse multiplication sentences, where the divisor and quotient are now the factors.

2. **(a)** 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
(b) 9, 18, 27, 36, 45, 54, 63, 72, 81, 90
(c) 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
(d) 12, 24, 36, 48, 60, 72, 84, 96, 108, 120
(e) 50, 100, 150, 200, 250, 300, 350, 400, 450, 500
(f) 25, 50, 75, 100, 125, 150, 175, 200, 225, 250
(g) 40, 80, 120, 160, 200, 240, 280, 320, 360, 400
3. **(a)** Factors: 11, 2, 1; Multiples: 44, 88, 66
(b) Factors: 5, 1; Multiples: 50, 75, 125
(c) Factors: 9, 4, 12, 3; Multiples: 72, 108
(d) Factors: 1, 10, 30, 15, 2; Multiples: 60, 30, 90
(e) Factors: 5, 35, 7, 1; Multiples: 35, 105, 70
(f) Factors: 45, 15, 3, 5; Multiples: 45, 180, 135, 90
4. Every number is both a factor and a multiple of itself.

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2. **(a)** **(i)** 1
(ii) 4
(iii) 9
(iv) 16
(b) 1, 4, 9, 16, 25...
3. **(b)** 1, 3, 6, 10, 15, 21, 28, 36, 45...

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4. **(b)** 2, 6, 12, 20, 30, 42, 56...
5. **(a)** 1, 4, 9, 16, 25, 36, 49, 64, 81, 100
(b) 1, 3, 6, 10, 15, 21, 28, 36, 45, 55
(c) 2, 6, 12, 20, 30, 42, 56, 72, 90, 110
6. **(b)** **(i)** 144
(ii) 225
(iii) 400
(c) **(i)** 78
(ii) 120
(iii) 210
(d) **(i)** 156
(ii) 240
(iii) 420

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1. **(b)** Prime
(c) Composite
2. **(c)** It is neither prime nor composite
(d) They are prime
(e) They are composite

3.

Number	Odd	Even	Rect-angular	Square	Tri-angular	Composite	Prime
1	✓	×	×	✓	✓	×	×
2	×	✓	✓	×	×	×	✓
3	✓	×	×	×	✓	×	✓
4	×	✓	×	✓	×	✓	×
5	✓	×	×	×	×	×	✓
6	×	✓	✓	×	✓	✓	×
7	✓	×	×	×	×	×	✓
8	×	✓	×	×	×	✓	×
9	✓	×	×	✓	×	✓	×
10	×	✓	×	×	✓	✓	×
27	✓	×	×	×	×	✓	×
36	×	✓	×	✓	✓	✓	×
56	×	✓	✓	×	×	✓	×

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Learning Log

I can identify factors and multiples.

1. **(a)** 1, 3, 9
(b) 1, 2, 3, 4, 6, 12
(c) 1, 2, 4, 5, 10, 20
(d) 1, 2, 4, 8, 16, 32

2. **(a)** 9, 18, 27, 36, 45
(b) 12, 24, 36, 48, 60
(c) 20, 40, 60, 80, 100
(d) 32, 64, 96, 128, 160

I can identify square, rectangular and triangular numbers.

(a) 1, 4, 9, 16, 25
(b) 1, 3, 6, 10, 15
(c) 2, 6, 12, 20, 30

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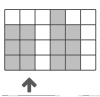
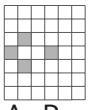
2. **(a)** patterns
(b) term
(c) core
(d) increasing, decreasing, sequences
(e) numbers
(f) rule

1.
(a) 
(b) ↑ →
(c)
(d) 65 54
(e) 
(f) A, B

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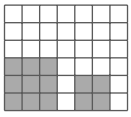
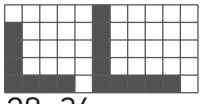
(g) 
(h)
(i) summer, autumn
(j) 
(k) 28, 36

3. **(a)** (b), (c), (f), (h), (i)
(c) (h)
(d) (b) and (i)
(e) (f)

4. **(a)** (a), (j), (k)
(b) **(a)** adding 1 square each time, squares organised vertically in pairs
(j) adding 2 squares each time to end of 'arms'
(k) +2, +3, +4 etc.
(b) **(d)** −1, −3, −5, −7 etc.
(e) Deleting 1 column of squares each time
(g) 5 rows of 5, to 4 rows of 4, to 3 rows of 3 etc.

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Learning Log

I can explore and extend patterns.

(a) 27.5, 29, 30.5, 32
(b) 20, 21, 22, 23
(c) 0, −5, −10, −15
(d) 28, 25, 26, 28

I can use T-charts to identify the rules of sequences and extend them.

(a) 1, 4, 9, 16, 25, 36, 49
(b) 1, 5, 9, 13, 17, 21, 25

I can solve number sentences with brackets.

(a) 6
(b) 9
(c) 3
(d) 52
(e) 6
(f) 48

I can solve number sentences using the order of operations.

(a) 26
(b) 20
(c) 8
(d) 8
(e) 5
(f) 19

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2. **(a)** 30 ml
(b) 80 ml
(c) 250 ml
(d) 490 ml
(e) 400 ml
(f) 920 ml

3. **(a)** 30 ml
(b) 1,000 ml
(c) 1,000 l
(d) 400 ml
(e) 3,000 ml
(f) 1,000 ml

4. **(a)** 1,000 ml
(b) 4,000 ml
(c) 3,100 ml
(d) 4,500 ml

5. **(a)** $1\frac{1}{5}$ l
(b) $7\frac{3}{4}$ l
(c) $2\frac{1}{2}$ l
(d) $\frac{1}{2}$ l
(e) $1\frac{1}{10}$ l
(f) $1\frac{3}{10}$ l

6. **(a)** 2.5 l
(b) 3.8 l
(c) 7.49 l

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1.

Object	Unit (ml or l)	Instrument of measurement
Medicine for a baby	ml	Medicine spoon
Kettle	l	Measuring jug
Glass	ml	500 ml graduated cylinder
Watering can	l	Measuring jug
Bottle	ml	500 ml graduated cylinder
Petrol can	l	Measuring jug
Food colouring	ml	20 ml syringe
Saucepan	l	Measuring jug
Hot water bottle	l	Measuring jug

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8. **(a)** amount, holds
(b) millilitres and litres
(c) eye dropper
(d) 100
(e) 1,000

Learning Log

I can write millilitres and litres in fraction and decimal form.

1. (a) $3\frac{1}{2}$ l = 3.5 l
   (b) $\frac{63}{100}$ l = 0.63 l
   (c) $\frac{75}{1000}$ l = $\frac{3}{40}$ l = 0.075 l
2. (a) $\frac{1}{2}$ l = 500 ml
   (b) $7\frac{40}{1000}$ l = $7\frac{1}{25}$ l = 7,040 ml
   (c) $1\frac{6}{1000}$ l = $1\frac{3}{500}$ l = 1,006 ml

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I can measure the capacity of containers using appropriate metric units.

(a) millilitre (ml)
(b) litre (l)

I can select an appropriate measuring instrument to measure capacity.

(a) D (100 ml graduated beaker)
(b) C (1 l measuring jug)
(c) B (eye dropper)
(d) C (1 l measuring jug)
(e) C (1 l measuring jug)

I can estimate the capacity of an object.

(a) 2 l
(b) 4 l
(c) 500 ml
(d) 15 ml
(e) 5 l
(f) 60 l

I can solve problems involving litres and millilitres.

7 jugs

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2. Number sentence
   Equals
   Greater than
   Less than
   Plus/add
   Minus/subtract
   Maximum
   Minimum
   Input-output rule
   Word problem

PAGE 95

2. (a) 15 × 4 = 60
   20 × 4 = 80
   17 × 4 = 68
   19 × 4 = 76
   13 × 4 = 52
   (b) 107 – 27 = 80
   149 – 27 = 122
   241 – 27 = 214
   263 – 27 = 236
   368 – 27 = 341
   (c) 7 ÷ 7 = 1
   49 ÷ 7 = 7
   63 ÷ 7 = 9
   42 ÷ 7 = 6
   70 ÷ 7 = 10
4. (a) 6 × 10 + 5 = 65
   9 × 10 + 5 = 95
   5 × 10 + 5 = 55
   10 × 10 + 5 = 105
   7 × 10 + 5 = 75
   (b) 16 ÷ 4 – 1 = 3
   20 ÷ 4 – 1 = 4
   32 ÷ 4 – 1 = 7
   28 ÷ 4 – 1 = 6
   40 ÷ 4 – 1 = 9
   (c) 5 × 6 + 2 = 32
   2 × 6 + 2 = 14
   7 × 6 + 2 = 44
   8 × 6 + 2 = 50
   9 × 6 + 2 = 56
5. Question 1:
   (a) input × 4 = output
   (b) input – 27 = output
   (c) input ÷ 7 = output

   Question 3:
   (a) input × 10 + 5 = output
   (b) input ÷ 4 – 1 = output
   (c) input × 6 + 2 = output

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1. (i) B, €130
   (ii) E, €54
   (iii) A, €8.48
   (iv) C, €800
   (v) F, €7,052
   (vi) D, 20%

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Learning Log

I can show and calculate equations.

(a) 22
(b) 28
(c) 9
(d) 4
(e) ×
(f) ×

I can use and calculate with the greater than and less than symbols.

(a) False
(b) True
(c) False
(d) False
(e) True
(f) False

I can identify and apply input-output rules and record them as equations.

16 × 5 = 80
32 × 5 = 160
21 × 5 = 105
17 × 5 = 85
28 × 5 = 140
3 × 8 = 24
5 × 8 = 40
9 × 8 = 72
7 × 8 = 56
8 × 8 = 64

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1. (a) At 0.75
   (b) At 1
   (c) At 0.5
   (d) At 0
   (e) At 0.25
2. (a) At 1
   (b) At 0
   (c) At 0
   (d) At 0.5
   (e) At 0.05 approximately
   (f) At 0.75

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Learning Log

I can identify and list all possible outcomes of simple random processes.

(a) Heads or tails
(b) Heads then heads, tails then tails, heads then tails, tails then heads
(c) 1, 2, 3, 4, 5, 6
   (i) 1 in 6 or $\frac{1}{6}$
   (ii) 5 in 6 or $\frac{5}{6}$
   (iii) 1 in 2 or $\frac{1}{2}$
   (iv) 1 in 2 or $\frac{1}{2}$
(d) (i) $\frac{2}{10}$ or $\frac{1}{5}$
   (ii) 0.3
   (iii) 50%

I can construct and use frequency charts and tables.

(a) $\frac{15}{34}$
(b) $\frac{7}{34}$
(c) $\frac{8}{34}$ or $\frac{4}{17}$
(d) $\frac{4}{34}$ or $\frac{2}{17}$

Pupil Assessment Book

PAGE 1

Marking scheme:
Q1: 8 marks, Q2: 4 marks, Q3: 3 marks, Q4: 3 marks, Q5: 6 mark, Q6–Q9: 1 mark each, Q10: 2 marks

1. Standard form: 30,405
Expanded form: 30,000 + 400 + 5
Word form: thirty thousand, four hundred and five
Nearest 10: 30,410
Standard form: 2.592
Expanded form: $2 + \frac{5}{10} + \frac{9}{100} + \frac{2}{1000}$
Word form: two and five hundred and ninety-two thousandths
Nearest unit: 3

2. **(a)** 30
(b) 60,000
(c) 86,409
(d) 20,083

3. **(a)** 98,765
(b) 10,234
(c) 9.876

4. **(a)** 4 thousands
(b) 6 ten thousands
(c) 45 hundredths

5. **(a)** Circle: 71,674; Underline: 60,741
(b) Circle: 0.9; Underline: 0.798
(c) Circle: 345.2; Underline: 3.452

6. 7

7. Units

8. Seven hundredths

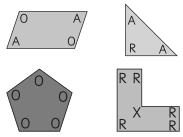
9. 61,760

10. €40,500

PAGE 2

Marking scheme:
Q1: 4 marks, Q2: 6 marks, Q3: 4 marks, Q4: 3 marks

1.



2. **(a)** 40° **(d)** 120°
(b) 60° **(e)** 170°
(c) 90° **(f)** 310°

4. **(a)** 60°
(b) 70°
(c) 34°

PAGE 3

Marking scheme:
Q1: 42 marks, Q2: 3 marks, Q3: 4 marks, Q4: 2 marks

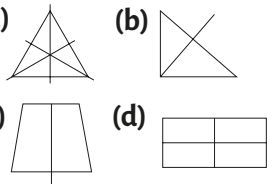
1.

Shape	Number of sides	Number of angles	Number of lines of symmetry	Has it parallel lines?	Can it tessel-late?	Name
	4	4	0	Yes	Yes	Parallelo-gram
	4	4	0	No	Yes	Quadrilat-eral
	4	4	1	Yes	Yes	Isosceles trapezium
	4	4	0	Yes	Yes	Scalene trapezium
	3	3	0	No	Yes	Scalene triangle
	3	3	3	No	Yes	Equilateral triangle
	3	3	1	No	Yes	Isosceles triangle

2.

Isosceles trapezium	Parallelogram	Scalene trapezium

3.
(a) **(b)**



(c) **(d)**

4. **(a)** 4.2 m
(b) 60°

PAGE 4

Marking scheme:
Q1: 15 marks, Q2: 12 marks, Q3: 5 marks, Q4: 3 marks

1. **(a)** 1.4
(b) 2.6
(c) 2.8
(d) 0.68
(e) 0.052
(f) 0.15
(g) 84,000
(h) 14,000
(i) 0.33
(j) 57,967
(k) 44,637
(l) 29,254
(m) 6.925
(n) 5.699
(o) 4.534

2. **(a)** 79,342
(b) 31,083
(c) 8.071
(d) 1.524

3. **(a)** 28,531
(b) 17,587
(c) 4.133
(d) 146
(e) 268

4. **(a)** 12,264
(b) 94,006
(c) 4.528

PAGE 5

Marking scheme:
Q1: 4 marks, Q2: 1 mark, Q3: 1 mark, Q4: 2 marks, Q5: 1 mark, Q6: 5 marks, Q7: 1 mark, Q8: 4 marks, Q9: 6 marks, Q10: 1 mark

1. **(a)** 6:30 a.m.
(b) Ballinasloe
(c) 55 mins
(d) 1 hr 30 mins

2. 4 hrs 54 mins

3. 10 hrs 18 mins

4. **(a)** 2 hr 22 mins
(b) 1 hr 48 mins

5. 31 hrs 45 mins

6. 5:25 a.m.
3:20 a.m.
3:40 p.m.
9:50 p.m.
7:45 a.m.
6:30 p.m.

7. 35 hrs

8. **(a)** 04:30
(b) 17:20
(c) 14:55
(d) 08:45

9. **(a)** 2:43 a.m.
(b) 4:35 p.m.
(c) 11:04 a.m.
(d) 11:27 p.m.
(e) 8:20 p.m.
(f) 6:06 a.m.

10. 3 hrs 40 mins

PAGE 6

Assessment A: Chapters 1–5

Marking scheme: 1 mark each

1. 1 hr 23 mins (83 mins)
2. 01479 or 10479
3. Isosceles trapezium
4. 60°
5. 28,570
6. 2 hrs 34 mins
7. 45°
8. (b) 245°
9. 5 units, $\frac{4}{10}$
10. 5:25 p.m.

PAGE 7

11. C
12. A= 65°
13. $\frac{8}{100}$ or 0.08
14. Equilateral
15. 73.437
16. 2.885
18. 22,153
19. 19,089
20. 7:28 p.m.

PAGE 8

Marking scheme:
Q1: 8 marks, Q2: 12 marks, Q3: 16 marks, Q4: 8 marks, Q5: 8 marks

1. **(a)** 820
(b) 50
(c) 64,000
(d) 56
(e) 42.3
(f) 14.56
(g) 0.006
(h) 0.204

2. **(a)** 0
(b) 82
(c) 37
(d) 46
(e) 80
(f) 108
(g) 320
(h) 360
(i) 198
(j) 52
(k) 120
(l) 68

3. **(a)** 210
(b) 1,200
(c) 1,000
(d) 36,000
(e) 1,000
(f) 14,000
(g) 27,000
(h) 60,000
(i) 40
(j) 70
(k) 90
(l) 70
(m) 70
(n) 40
(o) 30
(p) 80

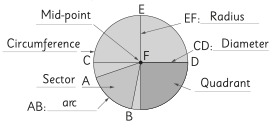
4. **(a)** 54,064
(b) 166,428
(c) 886.34
(d) 35.23
(e) 65 R7
(f) 62
(g) 2.46
(h) 0.097

5. **(a)** 5,200
(b) 1,232
(c) 98 km
(d) €1.35
(e) 7.938 kg
(f) **(i)** Bella
(ii) €78
(iii) €4,394

PAGE 9

Marking scheme:
Q1: 7 marks, Q2: 6 marks, Q3: 6 marks, Q4(a): 4 marks, Q4(b): 2 marks

1.



2. **(a)** radius
(b) circumference
(c) 360
(d) right angle
(e) circumference
(f) sector

3. **(a)**

Circle	Radius	Diameter
A	5.5 m	11 m
B	6.3 m	12.6 m
C	7 cm	14 m
D	4.1 m	8.2 m

(b) B
(c) D

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Marking scheme:
Q1: 1 mark, Q2: 4 marks, Q3: 4 marks, Q4: 5 marks, Q5: 1 mark, Q6: 1 mark, Q7: 1 mark, Q8: 2 marks, Q9: 2 marks, Q10: 1 mark

1. €3.50

2. **(a)** **(i)** €5.28
(ii) €8.77
(iii) €12.98
(b) €30.44

3. **(a)** €24
(b) €12
(c) €6
(d) €36

4. **(a)** €1.30
(b) €5.20
(c) €6.50
(d) €1.95
(e) €3.25

5. €32.40
6. €12.60
7. €27.20
8. **(a)** (ii) 2.5 kg of meat
(b) 25c
9. **(a)** (i) 3 litres of cooking oil
(b) 2c
10. €337.50

PAGE 11

Marking scheme:
Q1: 10 marks, Q2: 8 marks, Q3: 6 marks, Q4: 8 marks, Q5: 8 marks

1. **(a)** **(i)** $\frac{5}{9}$
(ii) $\frac{4}{9}$
(b) **(i)** $\frac{3}{5}$
(ii) $\frac{2}{5}$
(c) **(i)** $\frac{2}{3}$
(ii) $\frac{1}{3}$
(d) **(i)** $\frac{1}{3}$
(ii) $\frac{2}{3}$
(e) **(i)** $\frac{3}{7}$
(ii) $\frac{4}{7}$

2. **(a)** 3
(b) 12
(c) 4
(d) 6
(e) 3
(f) 10
(g) 10
(h) 12

3. **(a)** $\frac{1}{12}, \frac{1}{7}, \frac{1}{3}$
(b) $\frac{1}{11}, \frac{6}{11}, \frac{8}{11}$
(c) $\frac{3}{9}, \frac{3}{6}, \frac{3}{3}$
(d) $\frac{4}{12}, \frac{1}{2}, \frac{2}{3}$
(e) $\frac{2}{10}, \frac{1}{4}, \frac{7}{12}$
(f) $\frac{2}{3}, \frac{10}{12}, \frac{7}{8}$

4. **(a)** 8
(b) 7
(c) 27
(d) 63
(e) 48
(f) 20
(g) 54
(h) 96

5. **(a)** 38
(b) 288
(c) $3\frac{1}{3}$
(d) $2\frac{9}{10}$
(e) **(i)** $\frac{2}{9}$
(ii) 40 km
(f) **(i)** $\frac{1}{4}$
(ii) 15

PAGE 12

Marking scheme:
Q1: 8 marks, Q2: 36 marks, Q3: 6 marks

1. **(a)** True
(b) False
(c) False
(d) False
(e) True
(f) True
(g) True
(h) False

2.

Object	Regular/ irregular	2D shape of each face	Number of edges	Number of faces	Number of vertices	Name
	Regular	Square	12	6	8	Cube
	Irregular	Pentagon and rectangle	15	7	10	Irregular pentagonal prism
	Irregular	Hexagon and rectangle	18	8	12	Hexagonal prism
	Regular	Triangle	6	4	4	Triangular pyramid
	Regular	Triangle and rectangle	9	5	6	Triangular prism
	Regular	Pentagon and triangle	10	6	6	Pentagonal pyramid

3.

Cube	Cuboid	Tetrahedron

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Assessment B: Chapters 1–10

Marking scheme: 1 mark each

1. 2 hours 40 minutes
2. 34
3. 30°
4. A reflex angle
5. €4.32
6. Tens
7.
8. 16 cm
9. False
10. €9.34

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11. 70,085
13. Pentagonal prism
14. 22:30
15. $1\frac{2}{3}$
16. €562.50
17. 90°
18. 3
19. (a) Cylinder
20. 72,000

PAGE 15

21. 304 cm²
22. 118.9 km
23.
24. 0.84 m
25. 20.532
26. $\frac{3}{8}$
27. (i) 500 ml at €2.20, by 40c per litre
28. 1.45
30. 180

PAGE 16

Marking scheme:
Q1: 20 marks,
Q2: 7 marks,
Q3: 16 marks,
Q4: 15 marks

1. **(a)** 26, 52, 65, 104, 130
(b) 38, 76, 95, 152, 190
(c) 46, 92, 115, 184, 230
(d) 62, 124, 155, 248, 310

2. **(a)** 370 ÷ 37 = 10
(b) 210 ÷ 21 = 10
(c) 250 ÷ 50 = 5
(d) 280 ÷ 40 = 7
(e) 700 ÷ 35 = 20
(f) 620 ÷ 62 = 10
(g) 520 ÷ 52 = 10
(h) 400 ÷ 50 = 8

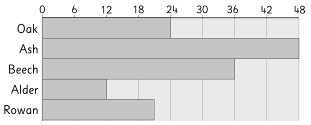
3. **(a)** 9 R26
(b) 15
(c) 14
(d) 13
(e) 11 R6
(f) 0.102
(g) 9 R21
(h) 0.65

4. **(a)** 30
(b) €1.06
(c) €15
(d) **(i)** 18
(ii) 9
(iii) 40
(e) **(i)** 23
(ii) 5

PAGE 17

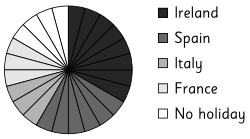
Marking scheme:
Q1: 4 marks, Q2: 1 mark, Q3: 1 mark, Q4: 5 marks, Q5: 4 marks, Q6: 5 marks

1. **(a)** 33
(b) 100
(c) €3.30
(d) 3
2. €2.20
3. €73,800
4. Scale interval 1:6



5. **(a)** 10 **(b)** 35
(c) 15 **(d)** 8

6.



PAGE 18

Marking scheme:
Q1: 30 marks, Q2: 4 marks, Q3: 4 marks, Q4: 4 marks, Q5: 4 marks, Q6: 6 marks, Q7: 4 mark, Q8: 4 marks, Q9: 3 marks

1. A:
(a) **(i)** 0.1
(ii) $\frac{1}{10}$
(iii) 10%
(b) **(i)** 0.9
(ii) $\frac{9}{10}$
(iii) 90%

B:
(a) **(i)** 0.17
(ii) $\frac{17}{100}$
(iii) 17%
(b) **(i)** 0.83
(ii) $\frac{83}{100}$
(iii) 83%

C:
(a) **(i)** 0.92
(ii) $\frac{23}{25}$
(iii) 92%
(b) **(i)** 0.08
(ii) $\frac{2}{25}$
(iii) 8%

D:
(a) **(i)** 0.75
(ii) $\frac{3}{4}$
(iii) 75%
(b) **(i)** 0.25
(ii) $\frac{1}{4}$
(iii) 25%

E:
(a) **(i)** 0.34
(ii) $\frac{17}{50}$
(iii) 34%
(b) **(i)** 0.66
(ii) $\frac{33}{50}$
(iii) 66%

2. **(a)** 1.76 **(c)** 15.037
(b) 3.48 **(d)** 7.407
3. **(a)** 28% **(c)** 40%
(b) 40% **(d)** 5%
4. **(a)** 0.7 **(c)** 0.03
(b) 0.65 **(d)** 1.0
5. **(a)** $\frac{27}{50}$ **(c)** $\frac{9}{10}$
(b) $\frac{4}{5}$ **(d)** $\frac{9}{20}$
6. **(a)** < **(d)** >
(b) < **(e)** =
(c) < **(f)** <
7. **(a)** 0.34, 43%, $\frac{3}{4}$
(b) 0.03, 13%, $\frac{3}{10}$
(c) 7%, $\frac{7}{20}$, 0.72
(d) 2%, $\frac{3}{20}$, 0.2
8. red = 10, blue = 5, yellow = 4, green = 1
9. **(a)** €48
(b) €36
(c) €37.50

PAGE 19

Marking scheme:
Q1: 6 marks, Q2: 8 marks, Q3: 8 marks, Q4: 4 marks, Q5: 4 marks, Q6: 1 mark, Q7: 1 mark

1. **(a)** C **(b)** B **(c)** B **(d)** B **(e)** A **(f)** C

2. **(a)** 20 mm **(b)** 80 mm **(c)** 90 mm **(d)** 640 mm **(e)** 123 mm **(f)** 52 mm **(g)** 808 mm **(h)** 37.5 mm

3. **(a)** 4 cm **(b)** 9.5 cm **(c)** 6 cm **(d)** 18.7 cm **(e)** 10.1 cm **(f)** 70.5 cm **(g)** 83.7 cm **(h)** 56 cm

4. **(a)** 4 mm, 4 cm, 44 m **(b)** 77 mm, 7 m, 770 cm **(c)** 8.1 cm, 82 mm, 0.18 m **(d)** 0.04 m, 400 mm, 49 cm

5. **(a)** 38.4 cm **(b)** 36 cm **(c)** 38 cm **(d)** 42 cm

6. 3 cm

7. 6.5 cm

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Marking scheme:
Q1: 9 marks, Q2: 6 marks, Q3: 3 marks, Q4: 3 marks, Q5–Q8: 1 mark each

1. **(a)** cm^2 **(b)** m^2 **(c)** m^2 **(d)** cm^2 **(e)** cm^2 **(f)** m^2 **(g)** cm^2 **(h)** m^2 **(i)** m^2

2. **(a)** 1 **(b)** 3 **(c)** 5 **(d)** 2 **(e)** 6 **(f)** 4

3. **(a)** 14 cm^2 **(b)** 24 cm^2 **(c)** 49 cm^2

4. **(a)** 75 cm^2 **(b)** 44.5 cm^2 **(c)** 122 cm^2

5. 27 cm

6. 144 m^2

7. 252 cm^2

8. 28 m^2

PAGE 21

Marking scheme:
Q1: 15 marks, Q2: 6 marks, Q3: 3 marks, Q4: 3 marks, Q5: 2 marks

1. **(a)** 446 **(b)** 41.7 **(c)** 75,412 **(d)** 0.79 **(e)** 847 **(f)** 311 **(g)** 9.5 **(h)** 0.846 **(i)** 284 **(j)** 98,900 **(k)** 42,241 **(l)** 6.3 **(m)** 41,300 **(n)** 4.7 **(o)** 0.13

2. **(a)** 91 **(b)** 725 **(c)** 6,344 **(d)** 481 **(e)** 72,222 **(f)** 0.36

3. **(a)** 0.369 kg **(b)** 75,556 **(c)** 3,800

4. **(a)** 28.5 kg **(b)** 0.85 kg **(c)** 1.85 kg

5. **(a)** 14,445 **(b)** 12,450

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Marking scheme:
Q1: 4 marks, Q2: 4 marks, Q3: 8 marks, Q4: 6 marks, Q5: 4 marks, Q6: 2 marks, Q7–Q11: 1 mark each, Q12: 2 marks

1. −5, −4, −3...3, 4, 5
−25, −20, −15...15, 20, 25

2. **(a)** 0, −2, −4 **(b)** −9, −12, −15 **(c)** −20, 0, 20 **(d)** 1, −1, −3

3. **(a)** +4 **(b)** 5 **(c)** −2 **(d)** −6 **(e)** −8 **(f)** +19 **(g)** 16 **(h)** −24

4. **(a)** 9, +8, −2 **(b)** 2, −4, −6 **(c)** +7, −6, −10 **(d)** +8, −12, −19 **(e)** +26, 25, −20 **(f)** 24, −18, −25

5. **(a)** 9 **(b)** 14 **(c)** 9 **(d)** 12

6. **(a)** False **(b)** False

7. −22m

8. −€15

9. +4; 4th floor

10. −€20

11. €100

12 **(a)** Up **(b)** 10°C

PAGE 23

Marking scheme:
Q1: 9 marks, Q2: 4 marks, Q3: 3 marks, Q4: 12 marks, Q5: 8 marks, Q6–Q10: 1 mark each

1. **(a)** Kitchen scales **(b)** Weigh bridge **(c)** Weigh bridge **(d)** Bathroom scales **(e)** Spring balance **(f)** Kitchen scales **(g)** Spring balance **(h)** Kitchen scales **(i)** Kitchen scales

2. **(a)** 5 kg **(b)** $\frac{3}{10}$ kg or $\frac{3}{100}$ kg **(c)** 5 g **(d)** 25 g

3. **(a)** 4 kg **(b)** 75 kg **(c)** 1 kg 10 g

4. **(a)** $9\frac{450}{1000} = 9.450$ kg **(b)** $2\frac{750}{1000}$ kg $= 2\frac{3}{4}$ kg $= 2.75$ kg **(c)** $3\frac{125}{1000}$ kg $= 3\frac{1}{8}$ kg $= 3.125$ kg **(d)** $1\frac{6}{1000}$ kg=1.006kg **(e)** $4\frac{955}{1000}$ kg=4.955kg **(f)** $5\frac{1}{100}$ kg $= 5.01$ kg

5. **(a)** $5\frac{2}{5}$ kg = 5,400 g **(b)** $9\frac{3}{20}$ kg = 9,150 g **(c)** $6\frac{66}{125}$ kg = 6,528 g **(d)** $1\frac{1}{200}$ kg = 1,005 g

6. 5.656 kg

7. 13.12 kg

8. 9.28 kg

9. 57.17 kg

10. €1.37

PAGE 24

Marking scheme:
Q1: 7 marks, Q2: 2 marks, Q3: 2 marks, Q4: 6 marks, Q5: 4 marks, Q6: 4 marks, Q7: 4 marks, Q8–Q13: 1 mark each

1. **(a)** **(i)** 20, 56, 36, 12 **(ii)** 31, 49, 15, 3, 17, 29 **(iii)** 31, 3, 17, 29 **(iv)** 49, 15, 20, 56, 36, 12
(b) **(i)** 49, 36 **(ii)** 3, 15, 36 **(iii)** 12, 20, 56

2. 50, 52, 54, 56, 58, 60

3. 97, 99, 101, 103, 105, 107, 109

4. **(a)** Odd **(b)** Even **(c)** Even **(d)** Even **(e)** Even **(f)** Odd

5. **(a)** 1, 2, 4, 8 **(b)** 1, 2, 4, 8, 16 **(c)** 1, 2, 3, 4, 6, 8, 12, 24 **(d)** 1, 2, 3, 4, 6, 9, 12, 18, 36

6. **(a)** 7, 14, 21, 28, 35
(b) 15, 30, 45, 60, 75
(c) 22, 44, 66, 88, 110
(d) 25, 50, 75, 100, 125
7. **(a)** 36
(b) 9
(c) 81
(d) 25
8. 2, 3, 5, 7, 11, 13, 17, 19
9. 4, 6, 8, 10, 12, 14, 16, 18
10. 9, 15, 21, 25, 27
11. 1 × 48
2 × 24
3 × 16
4 × 12
6 × 8
12. 36
13. 11:45

PAGE 25

Marking scheme:
Q1: 8 marks, Q2: 5 marks, Q3: 12 marks, Q4: 5 marks

1. **(a)** $\frac{1}{2}, \frac{1}{8}, \frac{1}{4}$
(b) 600, 550, 500
(c) 560, 661, 762
(d) 120°, 150°, 180°
(e) −2, −5, −10
(f) 00:00, 00:20, 00:40
(g) 28, 36, 45
(h) 64, 81, 100
2. **(a)** 27°C
(b) **(i)** 7th run
(ii) 54 km
(c) **(i)** €25.60
(ii) €51.15
3. **(a)** 9 **(g)** 37
(b) 4 **(h)** 24
(c) 75 **(i)** 15
(d) 20 **(j)** 96
(e) 11 **(k)** 26
(f) 30 **(l)** 20
4. **(a)** (3 × 25) − 8 = 67
(b) 25 × (8 + 5 + 4) = 425
(c) (2 × 5.5) + (3 × 13) = 50
(d) (315 ÷ 9) − 24 = 11
(e) (90 − 30) ÷ 4 = 15

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Assessment C: Chapters 1–20
Marking scheme: 1 mark each

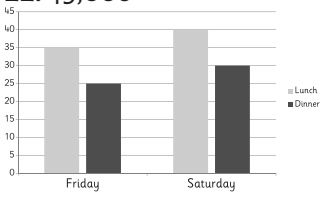
1. €48,000
2. 6 cm
3. C
4. 192.949 secs
5. 68,768
6. 1 hr 45 mins
7. (2 + 3) × 4 = 20
8. 12
9. Hexagonal prism
10. 0.65

PAGE 27

11. €507.50
12. 28
13. 80°
14. 75c
15. 42 cm
16. 3rd floor or +3
17. 5 l 390 ml = 5.39 l
18. 20%
19. 1: a bed
2: the teacher's desk
3: a tray
4: a computer screen
5: the cover of your maths book

PAGE 28

20. €43
21. 255 km
22. 45,006



24. 0.45, 54%, $\frac{4}{5}$
25. 198.15 kg
26. +8
27. Composite
28. 178 g
29. Square
30. Even
31. 0.526 l

PAGE 29

32. 40 cm²
33. 43,179
34. 6°C
35. 1,500 g
36. 8 kg 294 g = 8.294 kg
37. 15, 21, 28
38. 145 kg 350 g
39. 40 cm²
40. 3

PAGE 30

Marking scheme:
Q1: 6 marks, Q2: 4 marks, Q3: 3 marks, Q4: 4 marks, Q5: 4 marks, Q6: 4 marks, Q7: 1 mark, Q8: 1 mark

1. **(a)** F **(d)** E
(b) D **(e)** F
(c) C **(f)** F
2. **(a)** 5 l
(b) $\frac{3}{10}$ l
(c) 10 ml
(d) 250 ml
3. **(a)** 0.04 l
(b) 0.075 l
(c) $\frac{23}{1000}$ l
4. **(a)** $7\frac{550}{1000}$ l = 7.55 l
(b) $1\frac{170}{1000}$ l = 1.17 l
(c) $4\frac{582}{1000}$ l = 4.582 l
(d) $8\frac{5}{1000}$ l = 8.005 l
5. **(a)** $3\frac{1}{2}$ l = 3,500 ml
(b) $6\frac{3}{4}$ l = 6,750 ml
(c) $9\frac{17}{200}$ l = 9,085 ml
(d) $7\frac{1}{8}$ l = 7,125 ml
6. **(a)** 10.287 l
(b) 6.348 l
(c) 51.39 l
(d) 0.952 l
7. 6.455 l
8. 8.66 l

PAGE 31

Marking scheme:
Q1: 12 marks, Q2: 6 marks, Q3: 6 marks, Q4: 2 marks, Q5: 6 marks, Q6: 4 marks

1. **(a)** < **(g)** <
(b) < **(h)** =
(c) = **(i)** <
(d) < **(j)** >
(e) = **(k)** >
(f) > **(l)** <
2. **(a)** 100 **(d)** 348
(b) 20 **(e)** 19
(c) 39 **(f)** 39
3. **(a)** 111 **(d)** 167
(b) 514 **(e)** 31
(c) 51 **(f)** 7
5. **(a)** Function: + 4
−7 + 4 = −3
8 + 4 = 12
(b) Function: ÷ 15
45 ÷ 15 = 3
105 ÷ 15 = 7
(c) Function: × 3 + 1
4 × 3 + 1 = 13
10 × 3 + 1 = 31
6. **(a)** 193 − 117 = 76
(b) 8 × 35 = 280
(c) (870 ÷ 6) + 870 = 1,015
(d) (234 + 438) ÷ 12 = 56

PAGE 32

Marking scheme:
Q1–Q5: 1 mark each, Q6: 5 marks, Q7: 4 marks

1. Heads or tails
2. Heads, heads; tails, tails; heads, tails; tails, heads
3. Once
4. 3 boys; 3 girls; 2 boys and 1 girl; 2 girls and 1 boy; 1 boy and 2 girls; 1 boy, 1 girl and 1 boy; 1 girl and 2 boys; 1 girl, 1 boy and 1 girl
5. White
6. **(a)** **(i)** $\frac{1}{3}$
(ii) $\frac{4}{9}$
(iii) Zero, because there aren't any green cubes in the bag
(b) White
(c) Red and black
7. **(a)** All have an equal chance
(b) $\frac{1}{2}$
(c) Same chance
(d) No chance

Teacher's Resource Book

REINFORCEMENT

R1

1. (a) 20,000 + 3,000 + 100 + 40 + 9
   (b) 30,000 + 9,000 + 500 + 60 + 5
   (c) 60,000 + 2,000 + 100 + 70
   (d) 50,000 + 50 + 3
   (e) 80,000 + 4,000 + 800 + 6
   (f) 20,000 + 4,000 + 7
2. (a) 31,300
   (b) 16,800
   (c) 52,400
   (d) 25,800
   (e) 29,400
   (f) 19,800
   (g) 43,700
   (h) 36,500
3. (a) 35,000
   (b) 19,000
   (c) 55,000
   (d) 42,000
   (e) 31,000
   (f) 36,000
   (g) 22,000
   (h) 23,000
4. (a) 0.7
   (b) 0.72
   (c) 0.9
   (d) 0.87

R2

1. (a) Obtuse angle
   (b) Acute angle
   (c) Obtuse angle
   (d) Acute angle
   (e) Acute angle
   (f) Right angle
   (g) Straight angle
   (h) Right angle
   (i) Reflex angle
   (j) Acute angle
2. (a) 40^0
   (b) 85^0
   (c) 105^0
   (d) 170^0
3. A = 90^0, B = 30^0 and C = 110^0

R3

1. Circle the rectangle, parallelogram, trapezium and rhombus
2. (a) Equilateral triangle
   (b) Square
   (c) Trapezium
   (d) Rhombus
   (e) Parallelogram
   (f) Isosceles triangle
3. 7 cm
4. 40^0
5. 12 cm

R4

1. 13.9 km
2. 9,000
3. €18,500
4. 4,500
5. 31,000

R5

1. (a) 85 mins
   (b) 230 mins
   (c) 90 mins
   (d) 127 mins
2. (a) 1 hr 6 mins
   (b) 1 hr 29 mins
   (c) 1 hr 44 mins
   (d) 2 hrs 34 mins
3. 1 hr 10 mins
4. (a) 141 mins or 2 hrs 21 mins
   (b) 5 hrs 55 mins
   (c) 9 hrs 23 mins
   (d) 8 hrs 23 mins
5. (a) 18 mins
   (b) 1 hr 22 mins
   (c) 1 hr 37 mins
   (d) 2 hrs 49 mins
6. (a) 96 mins or 1 hr 36 mins
   (b) 3 hrs 10 mins
   (c) 16 hrs 30 mins
   (d) 63 hrs 10 mins
7. 204 mins or 3 hrs 24 mins
8. 32 hrs 5 minutes
9. (a) 2:35 p.m.
   (b) 6:13 a.m.
   (c) 11:50 p.m.
   (d) 5:40 p.m.
   (e) 1:45 a.m.
   (f) 8:20 p.m.
   (g) 11:32 a.m.
   (h) 9:10 p.m.
10. (a) 15:05
    (b) 06:30
    (c) 20:50
    (d) 02:45
    (e) 10:36
    (f) 19:35

R6

1.

÷1,000	÷100	÷10	Number
0.065	0.65	6.5	**65**
0.078	0.78	7.8	**78**
0.103	1.03	10.3	**103**
0.249	2.49	24.9	**249**
0.007	0.07	0.7	**7**
	0.014	0.14	**1.4**
		0.204	**2.04**

Number	x 10	x 100	x 1,000
65	650	6,500	65,000
78	780	7,800	78,000
103	1,030	10,300	
249	2,490	24,900	
7	70	700	7,000
1.4	14	140	1,400
2.04	20.4	204	2,040

2. (a) 3 × 100 = 300
   (b) 4 × 200 = 800
   (c) 2 × 400 = 800
   (d) 400 × 2 = 800
   (e) 4 × 100 = 400
   (f) 400 × 3 = 1,200
   (g) 2 × 200 = 400
   (h) 3 × 400 = 1,200
   (i) 5 × 1,000 = 5,000
   (j) 2 × 2,000 = 4,000
   (k) 3 × 2,000 = 6,000
   (l) 4,000 × 8 = 32,000
   (m) 9 × 4,000 = 36,000
   (n) 5,000 × 3 = 15,000
   (o) 9 × 6,000 = 54,000
   (p) 2 × 5,000 = 10,000
3. (a) 2 × 3 = 6
   (b) 4 × 1 = 4
   (c) 2 × 2 = 4
   (d) 2 × 1 = 2
   (e) 10 × 4 = 40
   (f) 3 × 10 = 30
   (g) 5 × 40 = 200
   (h) 2 × 20 = 40
4. (a) 10 × 300 = 3,000
   (b) 10 × 500 = 5,000
   (c) 20 × 800 = 16,000
   (d) 10 × 200 = 2,000
   (e) 20 × 600 = 12,000
   (f) 20 × 700 = 14,000
   (g) 1,000 × 10 = 10,000
   (h) 1,000 × 10 = 10,000
5. (a) 10 × 2 = 20
   (b) 10 × 6 = 60
   (c) 20 × 4 = 80
   (d) 10 × 7 = 70
   (e) 20 × 30 = 600
   (f) 20 × 30 = 600
   (g) 20 × 30 = 600
   (h) 10 × 20 = 200
6. (a) €1.80 ÷ 3 = €0.60
   (b) €1.20 ÷ 6 = €0.20
   (c) €2.50 ÷ 5 = €0.50
   (d) €1.20 ÷ 2 = €0.60
   (e) €1.60 ÷ 8 = €0.20
   (f) €1.60 ÷ 4 = €0.40
   (g) €2.40 ÷ 2 = €1.20
   (h) €2.10 ÷ 7 = €0.30

Calculator answers to Questions 2–6

2. (a) 309
   (b) 852
   (c) 870
   (d) 722

(e) 560
(f) 1,293
(g) 482
(h) 1,239
(i) 7,290
(j) 3,342
(k) 4,854
(l) 35,680
(m) 32,859
(n) 14,601
(o) 50,517
(p) 9,516

3. (a) 6.9
(b) 4.4
(c) 4.8
(d) 2
(e) 54
(f) 42.6
(g) 215.5
(h) 46.6

4. (a) 3,156
(b) 5,876
(c) 11,415
(d) 2,366
(e) 9,808
(f) 12,631
(g) 17,592
(h) 17,849

5. (a) 28.8
(b) 81.9
(c) 63
(d) 99.4
(e) 419.2
(f) 579.7
(g) 499.2
(h) 266.5

6. (a) €0.63
(b) €0.21
(c) €0.51
(d) €0.62
(e) €0.21
(f) €0.41 R 2
(g) €1.24
(h) €0.30 R 4

R7

1. A = Diameter,
B = Circumference,
C = Radius,
D = Arc
2. 6 m
3. 19 m
4. 12 cm
6. (a) A = 60°, B = 130° and C = 100°
(b) A = Acute angle,
B = Reflex angle
C = Obtuse angle

R8

1. (a) €9.05
(b) €7.15
(c) €73.25
(d) €24.83
2. €4.75
3. €15.28
4. (a) 26 c
(b) 46 c
(c) €1.15
(d) €3.02
5. €4.20
6. €12, €36
7. (a) €1.11
(b) €6.50
(c) €1.30
8. (a) (i) €5.85
(ii) €29.25
(b) (i) €15.50
(ii) €46.50
(c) €320
9. (a) 5 for €1.85 (37 c per lemon)
(b) €5.55 rather than €6, so saving 45 c
10. (a) One tree for €45
(b) €6
11. (a) €16.50 per hour
(b) €12

R9

2. (a) (i) $\frac{1}{4}$
(ii) eighths
(iii) $\frac{2}{8}$
(b) (i) $\frac{2}{5}$
(ii) tenths
(iii) $\frac{4}{10}$
(c) (i) $\frac{3}{3}$
(ii) sixths
(iii) $\frac{6}{6}$
(d) (i) $\frac{2}{3}$
(ii) ninths
(iii) $\frac{6}{9}$
(e) (i) $\frac{1}{3}$
(ii) twelfths
(iii) $\frac{4}{12}$
(f) (i) $\frac{1}{4}$
(ii) twelfths
(iii) $\frac{3}{12}$

R10

1. A = Cube,
B = Hexagonal prism,
C = Pentagonal prism,
D = Square pyramid,
E = Tetrahedron
2. (a) A = Pentagonal pyramid,
B = Cube,
C = Pentagonal prism,
D = Tetrahedron,
E = Sphere,
F = Triangular prism,
G = Square pyramid,
H = Cuboid,
I = Cylinder,
J = Cone
(b) Polyhedrons: A, B, C, D, F, G and H
3. Prisms: A, C, F, H and J,
Pyramids: B, D, E, G and I

R11

1. (a) 10
(b) 20
(c) 10
(d) 20
(e) 20
(f) 10
(g) 10
(h) 30
(i) 20
(j) 10
(k) 30
(l) 20
(m) 20
(n) 30
(o) 40
(p) 20

2. (a) 11
(b) 13
(c) 14
(d) 11
(e) 15
(f) 13 R 6
(g) 11 R 6
(h) 11 R 5
(i) 12
(j) 19
(k) 13
(l) 11

3. (a) 18 R 4
(b) 6
(c) 17
(d) 12 R 24
(e) 13
(f) 9
(g) 7 R 6
(h) 12
(i) 7
(j) 8 R 16
(k) 12 R 60
(l) 11

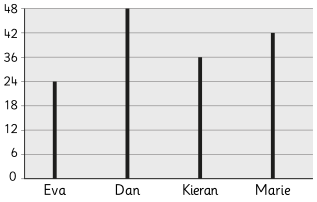
4. (a) 11 R 1
(b) 15 R 12
(c) 5 R 15
(d) 44 R 8
(e) 15 R 16
(f) 25 R 25
(g) 29 R 4
(h) 12 R 35
(i) 8 R 16
(j) 25 R 8
(k) 24 R 10
(l) 18 R 6
(m) 6 R 60
(n) 6 R 10
(o) 8 R 19
(p) 13 R 10

5. (a) 16
(b) 21 R 3
(c) 24
(d) 31 R 2

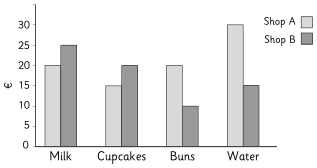
R12

1. (a) 14
(b) 20
(c) 15

2. 70 l
3. 36 years
4. €16.50
5.



6.



7. **(a)** 18
(b) 12
(c) 42
(d) 54
(e) 54

R13

1. **(a)** **(i)** S: $\frac{5}{100}$ or 0.05; US: $\frac{95}{100}$ or 0.95
(ii) S: $\frac{12}{100}$ or 0.12; US: $\frac{88}{100}$ or 0.88
(iii) S: $\frac{37}{100}$ or 0.37; US: $\frac{63}{100}$ or 0.63
(iv) S: $\frac{59}{100}$ or 0.59; US: $\frac{41}{100}$ or 0.41
(v) S: $\frac{64}{100}$ or 0.64; US: $\frac{36}{100}$ or 0.36
(vi) S: $\frac{1}{100}$ or 0.01; US: $\frac{99}{100}$ or 0.99
(b) **(i)** S: 5%; US: 95%
(ii) S: 12%; US: 88%
(iii) S: 37%; US: 63%
(iv) S: 59%; US: 41%
(v) S: 64%; US: 36%
(vi) S: 1%; US: 99%
(c) **(i)** 64%
(ii) 99%
(d) **(i)** 1%
(ii) 36%

2.

%	Decimal	Hundredths
27%	0.27	$\frac{27}{100}$
63%	0.63	$\frac{63}{100}$
39%	0.39	$\frac{39}{100}$
8%	0.08	$\frac{8}{100}$
2%	0.02	$\frac{2}{100}$
60%	0.6	$\frac{60}{100}$
30%	0.3	$\frac{30}{100}$

%	Decimal	Hundredths
81%	0.81	$\frac{81}{100}$
65%	0.65	$\frac{65}{100}$
52%	0.52	$\frac{52}{100}$
6%	0.06	$\frac{6}{100}$
9%	0.09	$\frac{9}{100}$
90%	0.9	$\frac{90}{100}$
70%	0.7	$\frac{70}{100}$

R14

1. **(a)** 40 mm
(b) 87 mm
(c) 1 mm
2. **(a)** 8.1 cm
(b) 57.2 cm
(c) 80.9 cm
3. **(a)** 4,200 m
(b) 9,075 m
(c) 65 m
4. **(a)** 0.57 km
(b) 0.029 km
(c) 2.384 km
5. **(a)** 85.39 m
(b) 5.074 km
(c) 2.05 m
(d) 10.318 km
6. **(a)** 1,652 m
(b) 43.28 m
(c) 873.9 m
7. **(a)** Perimeter A = (6.8 + 6.8 + 4.2 + 4.2) = 22 cm
(b) Perimeter B = (3 + 3 + 2.4 + 2.4) = 10.8 cm
(c) Perimeter C = (6.8 + 6.8 + 3.8 + 3.8) = 21.2 cm
8. 4,180 m /4.18 km
9. 24.6 m
10. 115 m
11. 42 km

R15

1.

Length	Width	Area
9 m	7 m	63 m²
8 m	8 m	64 m²
11 m	6 m	66 m²
12 m	12 m	144 m²
40 m	20 m	800 m²
33 m	11 m	363 m²

2. **(a)** 10 m
(b) €840
3. **(a)** Area = 37 cm²
(b) Area = 26 cm²
(c) Area = 17.5 cm²
(d) Area = 31 cm²

R16

1. **(a)** 76
(b) 83
(c) 66
(d) 88
(e) 118
(f) 390
(g) 760
(h) 1,090
(i) 348
(j) 499
(k) 3.5
(l) 5.9
(m) 7.9
(n) 6.6
(o) 7.8
2. **(a)** 45
(b) 53
(c) 35
(d) 35
(e) 34
(f) 224
(g) 661
(h) 543
(i) 561
(j) 337
(k) 4.4
(l) 6.1
(m) 1.6
(n) 3.4
(o) 3.3
3. **(a)** 83
(b) 80
(c) 94
(d) 163
(e) 174
(f) 625
(g) 1,023
(h) 823
(i) 461
(j) 743
(k) 4.2
(l) 11.4
(m) 10.1
(n) 12.4
(o) 8.3
4. **(a)** 79
(b) 58
(c) 18
(d) 15
(e) 18
(f) 387
(g) 358
(h) 588
(i) 593
(j) 170
(k) 0.9
(l) 1.8
(m) 3.9
(n) 2.7
(o) 3.6

R17

1. **(a)** –8
(b) –6
(c) –3
(d) –1
(e) +4
(f) +5
(g) +9
2. **(a)** 6
(b) 3
(c) 5
(d) 1
(e) 7
(f) 9
(g) 4
(h) 2

3. (a) 4
(b) 4
(c) 7
(d) 8
(e) 7
(f) 8
(g) 10
(h) 14
4. (a) +8
(b) 7
(c) +1
(d) 0
(e) –2
(f) +7
(g) 8
(h) +8
5. (a) +1
(b) –2
(c) –9
(d) –12
6. 4: –1, –2, –3
1: –1, –2, –3, –4
5: 1, –1, –3, –5
0: –6, –9, –12, –15
10: 0, –5, –10, –15
20: 0, –10, –20, –30
–7: –11, –13, –15, –17
–11: –7, –5, –3, –1
–15: –7, –3, 1, 5

R18

1. (a) 800 g
(b) 400 g
(c) 200 g
(d) 400 g
(e) 100 g
(f) 400 g
2. (a) 100 g
(b) 300 g
(c) 250 g
(d) 2,900 g
(e) 2,550 g
(f) 70 g
(g) 6,080 g
(h) 8,100 g
(i) 3,057 g
3. (a) 1 kg 500 g = 1.5 kg
(b) 1 kg 800 g = 1.8 kg
(c) 7 kg 500 g = 7.5 kg
(d) 1 kg 80 g = 1.08 kg
(e) 2 kg 70 g = 2.07 kg
(f) 3 kg 8 g = 3.008 kg
(g) 4 kg 5 g = 4.005 kg
(h) 8 kg 75 g = 8.075 kg
(i) 9 kg 9 g = 9.009 kg
4. (a) $1\frac{1}{4}$ kg
(b) $1\frac{1}{2}$ kg
(c) $1\frac{3}{4}$ kg
(d) $\frac{2}{5}$ kg
(e) $5\frac{1}{100}$ kg
(f) $6\frac{1}{20}$ kg

R19

2. Circle the following numbers: 26, 30, 32, 12, 16, 24
Cross out the following numbers: 13, 21, 31, 17, 23, 39
3. (a) 4, 8, 12, 16, 20, 24, 28, 32, 36, 40
(b) 6, 12, 18, 24, 30, 36, 42, 48, 54, 60
(c) 7, 14, 21, 28, 35, 42, 49, 56, 63, 70
(d) 11, 22, 33, 44, 55, 66, 77, 88, 99, 110
(e) 14, 28, 42, 56, 70, 84, 98, 112, 126, 140
(f) 30, 60, 90, 120, 150, 180, 210, 240, 270, 300
4. (a) 1, 2, 5, 10
(b) 1, 2, 7, 14
(c) 1, 5, 25
(d) 1, 3, 9, 27
(e) 1, 2, 4, 7, 14, 28
(f) 1, 2, 3, 4, 6, 9, 12, 18, 36
5. Prime: 2, 3, 5, 7, 11, 13, 17, 19
Composite: 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20

R20

1. (a) T T H T T H T T H T T H
(b) 11 14 19 11 14 19 11 14 19 11 14
(c) T Y T W T Y T W T Y T W
(d) 12 19 12 12 19 12 12 19 12 12
(e) P X B P P X B P P X B P
(f) 15 14 14 13 15 14 14 13 15 14
2. (a) 17, 19, 21 Rule +2
(b) 56, 66, 76 Rule +10
(c) 31, 28, 25 Rule –3
(d) 42, 48, 54 Rule +6
(e) 64, 59, 54 Rule –5
(f) 300, 350, 400 Rule +50
(g) 186, 189, 192 Rule +3
(h) 333, 222, 111 Rule –111
(i) 31, 36, 42 Rule +1, +2, +3, ...
(j) 49, 44, 38 Rule –1, –2, –3, ...
(k) 100, 150, 210 Rule +10, +20, +30, ...
(l) 103, 101, 100 Rule –1, –2, –1, –2, ...
(m) 48, 53, 59 Rule +1, +2, +3, ...
(n) 74, 71, 69 Rule –2, –3, –2, –3

R21

1. (a) 170 ml
(b) 260 ml
(c) 410 ml
(d) 50 ml
(e) 85 ml
2. (a) 1 ml eye dropper
(b) 5 ml measuring spoon
(c) 20 ml syringe
(d) 100 ml graduated cylinder
(e) 500 ml graduated cylinder
(f) 1 litre measuring jug
3. (a) 100 ml
(b) 400 ml
(c) 250 ml
(d) 1,900 ml
(e) 1,550 ml
(f) 80 ml
(g) 6,070 ml
(h) 8,100 ml
(i) 4,057 ml
4. (a) 1 l 500 ml = 1.5 l
(b) 1 l 700 ml = 1.7 l
(c) 7 l 500 ml = 7.5 l
(d) 1 l 60 ml = 1.06 l
(e) 2 l 70 ml = 2.07 l
(f) 4 l 2 ml = 4.002 l
(g) 5 l 5 ml = 5.005 l
(h) 6 l 7 ml = 6.007 l
5. (a) $1\frac{1}{4}$ l
(b) $1\frac{1}{2}$ l
(c) $1\frac{3}{4}$ l
(d) $\frac{2}{5}$ l
(e) $5\frac{1}{100}$ l
(f) $6\frac{1}{20}$ l
6. 2 l 925 ml
7. 23 drums

R22

2. (b) 7
(e) 5
(f) 3
(j) 9
(k) 6
(l) 20
3. (a) 9
(c) 7
(g) 7
(h) 7
(i) 11

R23

1. (a) 1, 2, 3, 4, 5, 6
(b) $\frac{1}{6}$
(c) $\frac{1}{2}\left(\frac{3}{6}\right)$

2. (a) False
   (b) True
   (c) False
   (d) True
   (e) True
   (f) True
   (g) False
   (h) True
3. (a) $\frac{1}{3}$
   (b) All three sections have an equal chance
   (c) Two times
   (d) No
   (e) No
   (f) No
   (g) No
   (h) Yes
   (i) No

EARLY FINISHERS

EF1

1. (a) (i) 1,273,000
   (ii) 32,000
   (iii) 131,000
   (iv) 519,000
   (v) 60,000
   (vi) 251,000
   (vii) 64,000
   (viii) 95,000
   (b) (i) 900
   (ii) 1,600
   (iii) 5,600
   (iv) 7,500
   (v) 1,300
   (vi) 6,100
   (vii) 2,500
   (viii) 2,100
   (c) Leitrim, Monaghan, Roscommon, Kilkenny, Mayo, Galway, Cork, Dublin
   (d) Cork, Galway, Mayo, Roscommon, Kilkenny, Leitrim, Monaghan, Dublin
2. (a) Leitrim
   (b) Mayo
   (c) (i) Monaghan
   (ii) Roscommon
   (iii) Dublin
   (iv) Kilkenny
   (v) Galway
   (vi) Cork
3. (a) (i) Dublin
   (ii) Leitrim
   (b) Dublin has highest population, yet smallest area. Leitrim has smallest population, yet the area is larger when compared to population.

EF2

1. A = 25°, B = 85°, C = 145°, D = 95°
2. A = 75°, B = 33°, C = 71°, D = 130°, E = 57°, F = 71°, G = 159°, H = 104°, I = 47°

EF3

1. (a) Obtuse scalene triangle
   (b) Rectangle
   (c) Isosceles trapezium
   (d) Right-angled triangle
   (e) Parallelogram
   (f) Isosceles triangle
2. A: Two pairs of parallel lines, B: Two pairs of parallel lines, C: Two pairs of parallel lines, D: Four pairs of parallel lines, E: One pair of parallel lines, F: Three pairs of parallel lines
3. A: One vertical line of symmetry, B: Four lines of symmetry, C: Six lines of symmetry, D: Six lines of symmetry

EF4

1. (a) 1
   (b) 8
   (c) 3
   (d) 0
   (e) 5
2. (a) (i) Tokyo
   (ii) Melbourne
   (b) (i) New York
   (ii) Hong Kong
   (c) London
   (d) New York
   (e) 27,045 km²
   (f) 15.221 million
   (g) 33.937 million
   (h) 16.749 million
   (i) (i) Hong Kong
   (ii) Melbourne
   (iii) Even though there are larger populations, Hong Kong's population is quite large when compared with its very small area. Melbourne has a large area and low population.

EF5

1. 3 hrs 35 mins
2. 19:09
3. 7:56 p.m.
4. (a) 7 hrs 34 mins
   (b) 12 hrs 30 mins
5. (a) 1 hr 47 mins
   (b) 20 mins
6. 4 hrs 24 mins
7. 1 hr 48 mins
8. 215 mins or 3 hrs 35 mins
9. (a) 17 hrs 40 mins
   (b) 41 hrs 28 mins
   (c) 260 hrs 42 mins
10. 33 hrs 36 mins
11. 168 hours
12. 4 April
13. (a) 1 hr 13 mins
    (b) 1 hr 2 mins
14. 8:43 a.m.
15.

24-hr clock digital	Using a.m. and p.m.
04:32	4:32 a.m.
15:45	3:45 p.m.
17:35	5:35 p.m.
15:50	3:50 p.m.
18:00	6 p.m.
05:55	5:55 a.m.
01:10	1:10 a.m.

EF6

1. (a) Machine no 1: × 6
   Machine no 2: × 9
   Machine no 3: × 8
   Machine no 4: × 7
   Machine no 5: × 5
   Machine no 6: × 10
   (b) a = 8
   b = 13
   c = 27
   d = 61
   e = 7
   f = 12
   g = 27
   h = 38
   i = 3
   j = 9
   k = 21
   l = 47
   m = 6
   n = 12
   o = 19
   p = 34
   q = 14
   r = 21
   s = 58
   t = 69
   u = 6
   v = 17
   w = 28
   x = 36
   (c) Yes: × 10 could also be × 5
2. (a) 1,768
   (b) 5,856
   (c) 8,274

EF7

3. **(a)** Area = 32 cm², Radius = 3 cm, Diameter = 6 cm
(b) Area = 12 cm², Radius = 3 cm, Diameter = 4 cm

EF8

1. **(a)** €15.54
(b) €8.01
(c) €47.22
(d) €20.13
2. **(a)** €22.08
(b) €17.41
3. €20.06
4. €7
5. €58.95
6. 6 hurleys: €168; 1 hurley: €28; 5 hurleys: €140; 11 hurleys: €308
7. €148,000
8. €7.35 + €7.35 + €7.35 = €22.05
9. **(a)** €12.50
(b) €12.20
(c) €12
10. **(a)** Best value is to buy 100 m (and she will have 20 m extra)
(b) Dearest: € 28.40, cheapest: € 17.50 She will save: €10.90
11. **(a)** Daily rate of €160
(b) €6
12. **(a)** Eve
(b) €44.50

EF9

1. **(a)** $\frac{29}{12}$ or $2\frac{5}{12}$
(b) **(i)** $4\frac{1}{4}$ km
(ii) $4\frac{1}{2}$ km
(iii) $4\frac{3}{4}$ km
(c) $5\frac{1}{4}$ km
(d) $1\frac{3}{8}$ km
(e) Via First Aid station
(f) $2\frac{3}{8}$ km
(g) First Aid station and the tea rooms
(h) $8\frac{3}{8}$ km (via restaurant)
(i) $4\frac{7}{12}$ km
2. **(a)** $\frac{1}{3}, \frac{5}{12}, \frac{1}{2}$
(b) $4\frac{4}{5}, 5\frac{9}{10}, 7$
(c) $4\frac{4}{9}, 5\frac{5}{9}, 6\frac{2}{3}$
(d) $7\frac{1}{6}, 7\frac{1}{12}, 7$
(e) $\frac{1}{8}, \frac{1}{16}, \frac{1}{32}$
(f) $\frac{2}{3}, 1\frac{1}{3}, 2\frac{2}{3}$

EF10

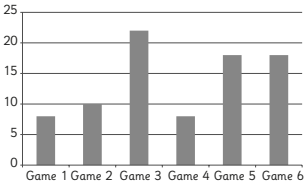
2. A, C and D
3. C and D
4. **(a)** **(i)** Cube
(ii) Square pyramid
(iii) Cylinder
(iv) Cuboid
(v) Cone
(vi) Triangular prism
(vii) Pentagonal prism
(viii) Pentagonal pyramid
(ix) Hexagonal prism
(x) Tetrahedron
(xi) Octagonal prism
(b) Prisms: (i), (iv), (vi), (vii), (ix) and (xi)
(c) Regular prisms: (i), (vi), (vii), (ix), (xi)

EF11

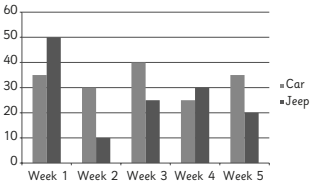
1. Machine no 1: × 2, Machine no 2: × 10, Machine no 3: × 8, Machine no 4: × 4, Machine no 5: × 9, Machine no 6: × 20
2. **(a)** 133
(b) **(i)** 5 **(ii)** 4
3. **(a)** A = 1
B = 0
C = 3
D = 9
E = 5
F = 7
(b) A = 0
B = 7
C = 2
D = 5
E = 3
(c) A = 2
B = 9
C = 0
D = 3
E = 4
F = 7
G = 8
H = 6
(d) A = 4
B = 7
C = 2
D = 3
E = 1
F = 8
G = 9
H = 0

EF12

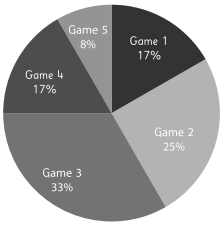
1. **(a)** 240
(b) €8.90
2. **(i)** 1155 **(ii)** 693
3. **(a)** 22
(b) 84
(c) In their first, second and fourth games
(d)



4. **(a)**



(b) 165 l
(c) 135 l
(d) 27 l
(e) **(i)** Weeks 1 and 4
(ii) Weeks 2, 3 and 5
(f) €78
(g) €32.40
5. **(a)** 300 g or 0.3 kg
(b) 600 g or 0.6 kg
(c) 200 g or 0.2 kg
(d) $\frac{1}{6}$



EF13

1. **(a)** $\frac{1}{2}$
(b) $\frac{50}{100}$
(c) 50%
(d) 0.8
(e) $\frac{80}{100}$
(f) $\frac{800}{1000}$
(g) 80%
(h) $\frac{1}{4}$
(i) $\frac{25}{100}$
(j) 25%
(k) 1.5
(l) $1\frac{500}{1000}$
(m) 150%
(n) $\frac{1}{8}$
(o) 0.125
(p) 12.5%
(q) $\frac{143}{1000}$
(r) $\frac{14.3}{100}$
(s) $\frac{143}{1000}$
(t) 14.3%
(u) $\frac{47}{100}$
(v) 0.47
(w) $\frac{47}{100}$
(x) $2\frac{3}{4}$
(y) $2\frac{75}{100}$
(z) $2\frac{750}{1000}$
2. **(a)** Option 2, Savings = €2.50

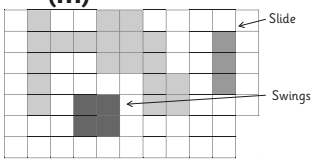
(b) Option 1 Savings = €0.50
(c) Option 1 Savings = €4.50
(d) Option 2 Savings = €1.60
(e) Option 2 Savings = €4.40
(f) Doesn't make a difference

3. **(a)** 41,000
(b) 61,500
(c) 73,800
(d) 65,600

4. **(a)** **(i)** Up 25%
(ii) Down 25%
(iii) Decreased 20%
(iv) 20% extra free
(v) Increased 50%
(vi) Less $33\frac{1}{3}$%
(vii) 10% discount
(viii) Reduced 30%
(b) **(i)** Increased 25%
(ii) Decreased $33\frac{1}{3}$%
(iii) Decreased 20%
(iv) Increased 25%

EF14

1. **(b)** 47 m
(e) 75 m²
(h) 32 m
(k) 38 m²
(m)



EF15

1.

Length	Width	Area	Perimeter
23 m	17 m	391 m²	80 m
18 m	13 m	234 m²	42 m
25 m	19 m	475 m²	88 m
24 m	16 m	384 m²	80 m
39 m	9 m	351 m	66 m
33 m	23 m	759 m²	112 m

2. **(a)** 30 m
(b) €3,400
(c) **(ii)** 416 m²

3. **(b)** **(i)** Area = 14 cm²
(ii) 16.25 cm²

EF16

1. **(a)** 5,895 m
(b) 6,194 m

2. **(a)** Mercury
(b) 1,405 km

3.

111	116	109
110	112	114
115	108	113

20.7	23.9	20.8
21.9	21.8	21.7
22.8	19.7	22

3.15	3.13	3.2
3.21	3.16	3.11
3.12	3.19	3.17

4. Zack's bag = 5.8 kg
Elena's Bag = 4.2 kg

5. **(a)** **(i)**
$$\begin{array}{r} 5.194 \\ +4.148 \\ \hline 9.342 \end{array}$$
(ii)
$$\begin{array}{r} 38.67 \\ +27.84 \\ \hline 66.51 \end{array}$$
(iii)
$$\begin{array}{r} 84,125 \\ -32,946 \\ \hline 51,179 \end{array}$$
(iv)
$$\begin{array}{r} 8.000 \\ -6.673 \\ \hline 1.327 \end{array}$$

EF17

1. **(a)** 2 − 3 = −1
(b) −2 + 5 = 3
(c) 1 + 2 − 5 = −2
(d) 3 − 4 + 4 = 3
(e) 4 + 1 − 6 + 5 = 4
(f) −1 + 3 − 2 + 3 = 3

2. **(a)** **(i)** +9 m **(ii)** −5 m **(iii)** +11 m **(iv)** −3 m **(v)** 0 m
(b) **(i)** 5:26 **(ii)** 4:54 **(iii)** 5:27 **(iv)** 5:09 **(v)** 5:24
(c) 5:16
(d) **(i)** 5:11 **(ii)** 25:55

3.

Details	Date	Amount	Balance
Cheque	1/6/__	+€100	€100
Tesco	3/6/__	−€40	€60
ATM	5/6/__	−€30	€30
ESB	10/6/__	−€50	−€20
Phone	14/6/__	−€30	−€50
Cheque	18/6/__	+€90	+€40
ATM	25/6/__	−€50	−€10
Phone credit	28/6/__	−€20	−€30
Cheque	30/6/__	+€100	+€70

4. **(a)** Fifth
(b) Twenty-fifth
(c) Fourteenth
(d) Ninth
(e) Nineteenth

EF18

1. **(a)** 500 g
(b) 450 g
(c) 150 g
(d) 2,130 g
(e) 2,040 g
(f) 3,003 g
(g) 6,990 g
(h) 8,100 g
(i) 9,053 g
(j) 6,017 g
(k) 9,999 g
(l) 105 g

2. **(a)** 1 kg 250 g = 1.25 g
(b) 8 kg 800 g = 8.8 kg
(c) 7 kg 540 g = 7.54 kg
(d) 1 kg 85 g = 1.085 kg
(e) 2 kg 222 g = 2.222 kg
(f) 3 kg 706 g = 3.706 kg
(g) 4 kg 40 g = 4.04 kg
(h) 1 kg 1 g = 1.001 kg
(i) 5 kg 7 g = 5.007 kg
(j) 6 kg 173 g = 6.173 kg

3. **(a)** $1\frac{24}{100}$ kg
(b) $1\frac{5}{100}$ kg $= 1\frac{1}{20}$ kg
(c) $1\frac{1}{4}$ kg
(d) $\frac{1}{5}$ kg
(e) $5\frac{2}{100}$ kg $= 5\frac{1}{50}$ kg
(f) $7\frac{3}{4}$ kg
(g) $8\frac{1}{100}$ kg
(h) $5\frac{4}{1000}$ kg $= 5\frac{1}{200}$ kg
(i) $\frac{57}{1000}$
(j) $\frac{101}{1000}$ kg
(k) $1\frac{18}{1000} = 1\frac{9}{500}$ kg
(l) $\frac{80}{1000}$ kg $= \frac{2}{25}$ kg

4. **(a)** 5 kg 700 g
(b) 2 kg 700 g
(c) 2 kg 800 g
(d) 1 kg 88 g
(e) 900 g
(f) 5 kg 600 g
(g) 1 kg 260 g
(h) 6 kg 50 g
(i) 1 kg 430 g

5. **(a)** 8.007 + 9.036 + 5.341 = 22.384 kg
(b) (2.087 kg + 4.009 kg) − 3.504 kg = 2.592 kg
(c) (8.4 kg + 5.670 kg) × 9 = 126.63 kg
(d) (5.45 kg + 4.9 kg − 4.56 kg) ÷ 7 = 0.82 kg

6. **(a)** **(i)** 5 kg **(ii)** €42.50
(b) 71.8 kg

EF19

1. **(a)** 4th triangular number = 10
(b) 5th triangular number = 15
(c) 25
(d) Square
(e) Yes; the sum of 2 consecutive triangular numbers always equals a square number i.e. nth triangular number + (n-1)th triangular number = nth square number

2. **(a)** 3rd triangular number = 6
(b) 3rd triangular number = 6
(c) 12
(d) Rectangle
(e) Yes; double any triangular numbers always equals a

rectangular number i.e. (2 × nth triangular number) = nth rectangular number Half of nth rectangular number = nth triangular number

3. (a) Prime numbers
   (b) Square numbers
   (c) Odd numbers
   (d) Triangular numbers
   (e) Multiples of 9
   (f) Rectangular numbers
   (g) Even numbers/ multiples of 2
   (h) Composite numbers
4. 28

EF20

1. (a) 17, 19, 23 (prime numbers)
   (b) 25%, 12.5%, 6.25% (halving each time)
   (c) 30, 31, 31 (number of days in each month)
   (d) 14, 15, 16 (composite numbers)
   (e) $\frac{7}{12}, \frac{2}{3}, \frac{3}{4}$ (going up by $\frac{1}{12}$ each time)
   (f) Th, TTh, HTh, (increasing place values)
2. (a) Square-based pyramid
   (b)

Term	Cans
1	1
2	4
3	9
4	16
5	25
6	36
7	49

   (c) 100
   (d) **(i)** 144 **(ii)** 230 **(iii)** 400
3. (a) 15
   (b) Triangular-based pyramid (tetrahedron)
   (c) 5
   (d)

Term	Cans
1	1
2	3
3	6
4	10
5	15

   (e) **(i)** 28 **(ii)** 45 **(iii)** 55
4. (a) **(i)** Triangular numbers: 15, 21, 28, 36
   (ii) Square numbers: 25, 36, 49, 64
   (iii) Rectangular numbers: 30, 42, 56, 72
   (b) Fibonacci numbers: 21, 33, 54, 87 The sum of each consecutive preceding term equals the next term.
5. (a) Fibonacci
   (b) Fibonacci
   (c) Triangular numbers

EF21

1. (a) 500 ml
   (b) 350 ml
   (c) 150 ml
   (d) 1,130 ml
   (e) 1,030 ml
   (f) 3,003 ml
   (g) 7,990 ml
   (h) 8,100 ml
   (i) 9,053 ml
   (j) 6,016 ml
   (k) 9,999 ml
   (l) 8,076 ml
2. (a) 1 l 150 ml = 1.15 l
   (b) 8 l 800 ml = 8.8 l
   (c) 6 l 530 ml = 6.53 l
   (d) 1 l 85 ml 1.085 l
   (e) 1 l 111 ml = 1.111 l
   (f) 3 l 607 ml = 3.607 l
   (g) 3 l 30ml = 3.03 l
   (h) 1 l 1 ml = 1.001 l
3. (a) 4 l 950 ml
   (b) 2 l 100 ml
   (c) 2.1 l
   (d) 1.53 l
   (e) 0.9 l
   (f) 4.8 l
   (g) 1.3 l
   (h) 6.05 l
4. (a) 5.3 l + 1.36 l + 1.086 = 7.746 l
   (b) (1.086 l + 3.009 l) − 3.503 l = 0.592 l
   (c) (3.65 l + 3.35 l) × 7 = 49 l
   (d) (5.35 l + 3.89 l − 3.56 l) ÷ 8 = 0.71 l
5. (a) 2,110 ml
   (b) 750 ml
   (c) Tom will need 30 l of paint. The paint will cost Tom €135.

EF22

1. (a) 20 and 15
   (b) 10 and 8
   (c) 9 and 4
   (d) 30 and 16
   (e) 45 and 40
   (f) 50 and 30
   (g) 10 and 10
2. (a) **(i)** ✓ **(ii)** × **(iii)** ✓ **(iv)** × **(v)** × **(vi)** ✓ **(vii)** ✓ **(viii)** ✓
   (b) **(i)** 30 g **(ii)** 75 g **(iii)** 30 g **(iv)** 500 g or 0.5 kg
   (c) **(i)** 75 g **(ii)** 175 g **(iii)** 0.75 kg
   (d) **(i)** 0.21 kg **(ii)** 3.9 kg **(iii)** 1.2 kg

EF23

1. (a) **(i)** $\frac{1}{6}$ **(ii)** $\frac{2}{6}$ or $\frac{1}{3}$ **(iii)** $\frac{3}{6}$ or $\frac{1}{2}$
   (b) **(i)** Black because there are three black cubes
   (ii) Spotted because there is only one spotted cube
   (iii) Black because there are more black cubes than any other type
2. (a) **(i)** 0.3 **(ii)** $\frac{1}{10}$ **(iii)** 0.4
   (b) **(i)** Black because there are more black cubes than any other type
   (ii) No, because there are three white cubes and only two spotted cubes
   (c) Good because there are three white cubes and so there is a $\frac{3}{10}$ chance that a white cube will be chosen
3. (a) **(i)** $\frac{1}{13}$ **(ii)** $\frac{3}{13}$
   (b) **(i)** Option A because she has a $\frac{9}{13}$ chance of picking a card with a number on it
   (ii) Pick a card that has a heart on it

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OPERATION MATHS

5th Class

Answer Booklet

The Educational Company of Ireland