Answers

Chapter 7 Statistics (III)

7.1 Knowing line graphs (1)

1 **(a)** time, temperature, 0.5 degrees Celsius (°C)
(b) At 08:00, 40°C
(c) 2
(d) Between 06:00 and 08:00
(e) Between 10:00 and 12:00
(f) Between 16:00 and 18:00
(g) She was getting better. From 8 o'clock in the morning, her temperature showed a downward tendency and, by 4 o'clock in the afternoon, it was steady.

2

Time	06:00	08:00	10:00	12:00
Temperature (°C)	37.5	40	39.5	37.5
Time	14:00	16:00	18:00	
Temperature (°C)	38	37	37	

3 **(a)** The peak times are at 08:00 and 17:00. These are the rush hours when people go to work in the morning and go back home in the afternoon (answer may vary).
(b) The number of people was least at 12 noon. This is during lunch time / the middle of the day when many people are at work (answers may vary).
(c) Various answers possible.

7.2 Knowing line graphs (2)

1 **(a)** the month of the year, the quantity sold
(b) December, June, 325 – 75 = 250, 325 + 75 = 400
(c) June to December, January to June
(d) July, January, 300 – 50 = 250, 300 + 50 = 350
(e) January to July, July to December
(f) Various answers possible. Explanations should mention the change of seasons. For example: People are more likely to buy picnic blankets in the Summer than in the Winter, so there should be more sales in Summer than Winter. The opposite is true of duvets, as people are more likely to buy them to keep warm in the Winter time.

2 **(a)** line, bar
(b) C, A
(c) £26 000, downward
(d) Spring in Year 2, Autumn in Year 2, 2

7.3 Knowing line graphs (3)

1 **(a)** D, C **(b)** B **(c)** A

2 **(a)** 100 marks, 70 marks
(b) It is a way of not having to show all of the blank part of the graph.
(c) From chapter test 5
(d) Chapter test 4
(e) Adams's scores mostly improve

3 **(a)**

Chapter	One	Two	Three	Four
Scores	70	77 (also accept 76 or 78)	75	90
Chapter	Five	Six	Seven	Eight
Scores	85	95	98	100

(b) Various answers possible. Answers should mention that Adam appears to have studied for all but tests 3 and 5 and that he steadily improved.
(c) Answers will vary. Check that they make sense.

7.4 Constructing line graphs

1 **(b)** units to be measured (other answers possible)
(c) axes

2 Graph should be drawn as follows:
– Overall horizontal axis labelled 'Time' (or similar), invididual labels contain the days of the week (from Monday to Sunday)
– Overall vertical axis labelled 'Number of people' (or similar), individual labels contain multiples of 10 (from 10 to 50)
– Points should be correctly plotted with straight lines connecting the points
(a) Wednesday, 46 people
(b) Between Saturday and Sunday
(c) Answers may vary. They should mention the two trends in the week. For example: The first half of the week shows an increasing tendency, while the second half of the week shows a downward tendency.
(d) 244

3 **(a)** Bar chart should show the same axes as before, with bars correctly drawn.
(b) Answers will vary. Check that they make sense.

4 Answers will vary. Check that the heights recorded in the table are plotted correctly on the line graph. Pupils should make reasonable predictions of their height based on the trends seen in the graph.

Chapter 7 test

1 **(a)** 500 **(b)** 4 **(c)** 50 **(d)** 2400
(e) 190 **(f)** 350 **(g)** 1 **(h)** 60

2 Column method used correctly for questions a–f.
(a) 4116 **(b)** 7248
(c) 3156 (Check: 3156 ÷ 4 = 789)
(d) 9 **(e)** 22
(f) 112 r 3 (Check: 112 × 70 + 3 = 7843)

3 **(a)** 913
(b) 1559 (Pupils may work out 786 + 114 first, then 900 + 659)
(c) 17 000 (Pupils may work out 250 × 4 first, then 1000 × 17)

4 **(a)** D C A B
(b) **(i)** 5, 35 **(ii)** 5 **(iii)** 4 **(iv)** 1, 5 **(v)** 110

5 **(a)** B **(b)** E

6 **(a)** 12th May, 18 pupils
(b) Between 10th and 11th May
(c) the 13th, 15th, 16th and 17th
(d) Answers will vary, but should reflect the downwards trend of the graph (so should be less than 9 absentees).
(e) 103

7 **(a)**

Year group	Year 1	Year 2	Year 3	Year 4	Year 5
Number of books donated	50	65	85	150	230

(b) Graph should be drawn as follows:
– Title of graph 'Number of books donated by a school' (or similar)
– Overall horizontal axis labelled 'Year group', invididual labels contain the names of the year groups (from Year 1 to Year 5)
– Overall vertical axis labelled 'Number of books donated' (or similar), individual labels contain multiples of 50 (from 50 to 250)
– Points should be correctly plotted with straight lines connecting the points.

(c) Answers may vary, but shoud mention the tendency that the number of donated books increases as the year groups become older.
(d) Bar chart should show the same axes as before, with bars correctly drawn.
(e) 580 books

Chapter 8 Geometry and measurement (I)

8.1 Acute and obtuse angles

1 **(a)** obtuse **(b)** obtuse
(c) acute **(d)** right

2 Acute angles: half past 3, half past 5, 11 o'clock
Right angles: 3 o'clock, 9 o'clock
Obtuse angles: 4 o'clock, half past 9

3 6, 4, 4, 8

4 Acute angles: 1, 4, 7
Right angles: 3, 6
Obtuse angles: 2, 5, 8

5 **(a)** ✗
(b) ✓
(c) ✗
(d) ✗

6 5, 16

7 Lines should be perpendicular to each other and form a cross.

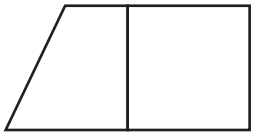
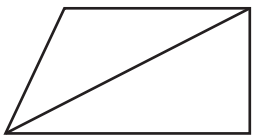
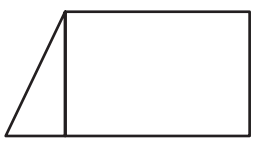
8.2 Triangles and quadrilaterals (1)

1 Triangle(s): 3, 7, 9, 10, 13
Quadrilateral(s): 1, 2, 4, 5, 8, 11, 12, 14, 15

2 All three shapes correctly copied on the grid

3 **(a)** 3, square
(b) 3, 3 4, 4
(c) quadrilaterals, opposite, four
(d) square
(e) 5, 1

4 **(a)** ✗ **(b)** ✗ **(c)** ✓ **(d)** ✗

5 Various answers possible. For example:
(a)

(b)

(c)


6 9, 10

8.3 Triangles and quadrilaterals (2)

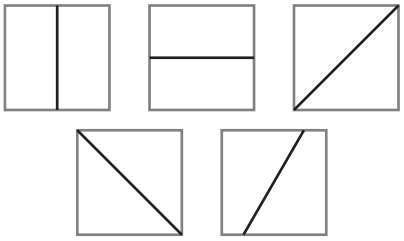
1 **(a)** hexagon
(b) quadrilateral
(c) triangle (equilateral triangle)
(d) quadrilateral
(e) rectangle (or quadrilateral)
(f) pentagon
(g) octagon **(h)** square

2 **(a)** ✗ **(b)** ✓ **(c)** ✓ **(d)** ✓

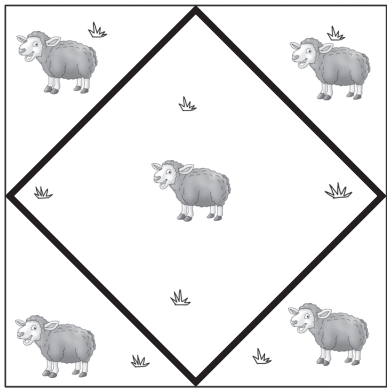
3 **(a)** dots connected to form a triangle around the cat, a pentagon around the parrot and a rectangle around the rabbit
(b) rectangle, pentagon, triangle
(c) rabbit

4 **(a)** 2, 5, 7, 9, 10, 11, 16
(b) 2, 3, 5, 8, 10, 11, 13, 16
(c) 14, 15

5 Answers may vary. For example:



6



8.4 Classification of triangles (1)

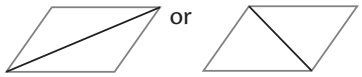
1 **(a)** right-angled triangle, 1, 2, 5, 10
(b) obtuse angle, 7, 8
(c) acute, 3, 4, 6, 9

2 **(a)** obtuse **(b)** right-angled **(c)** acute

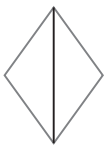
3 **(a)** ✓ **(b)** ✗ **(c)** ✗

4 Each type of triangle drawn correctly.

5 **(a)**



(b)



6 Various answers possible, depending on where the cut is made (6 or 5 or 4).

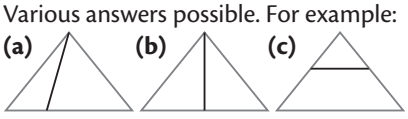
8.5 Classification of triangles (2)

1 2, 5, 6
1, 7
3, 4

2 **(a)** B **(b)** B **(c)** D
(d) D **(e)** B **(f)** D

3 13 5
6 2

4 Various answers possible. For example:
(a) **(b)** **(c)**



5 Various answers possible. For example:

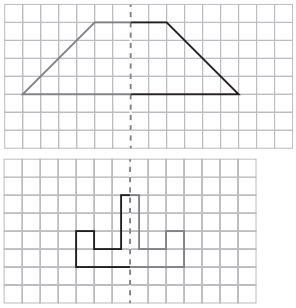
8.6 Line symmetry

1 ✓✓✗✓✗

2 Vertical lines of symmetry drawn correctly on the first and fourth shapes
Vertical, horizontal or diagonal line of symmetry drawn correctly on the second shape

3 0, 3, 8, with lines of symmetry drawn correctly (accept 1 if pupil has written as a straight line)

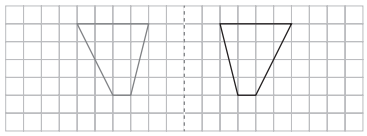
4



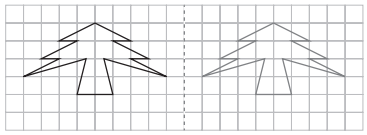
5 A, B, C, D, E, H, I, K, M, O, T, U, V, W, X, Y, with lines of symmetry drawn correctly

6 Symmetrical shapes completed on the grids as follows:

(a)



(b)



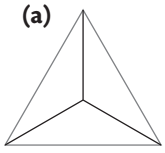
8.7 Classification of triangles (3)

1 **(a)** isosceles **(b)** equilateral
(c) symmetry, 1 **(d)** symmetry, 3
(e) acute

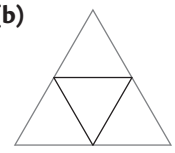
2 **(a)** 5, 10 **(b)** 1, 2, 7, 9 **(c)** 3, 4, 6, 8,

3 Isosceles and equilateral triangles drawn correctly with lines of symmetry shown

4 **(a)**



(b)



5 **(a)** 33, 7 **(b)** 35

8.8 Areas

1 9, 9, 11, 11

2 20, 20, 18, 19, 12, 12, 2, 112

3 16 13 42

4 Any three shapes drawn with areas 7, 9 and 12 squares respectively

5 3 5.5

8.9 Areas of rectangles and squares (1)

1 **(a)** 16 $4 \times 4 = 16$ 16 cm^2
(b) 12 $3 \times 4 = 12$ 12 cm^2

2 **(a)** 24 cm^2 **(b)** 24 cm^2 **(c)** 25 cm^2

3 405 cm^2

4 1200 cm^2

5 300 cm^2

6 There are 3 possible rectangles: 1×12, 2×6, 3×4

7 144 cm^2

8.10 Areas of rectangles and squares (2)

1 **(a)** 12 cm^2 **(b)** 36 cm^2 **(c)** 7 cm

2 9450 cm^2

3 1200 cm^2

4 144 cm^2

5 160 cm^2

6 54 cm^2

8.11 Square metres

1 **(a)** 1 square metre 1 m^2
(b) 1 square centimetre 1 cm^2

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

3 40 m^2 2500 m^2 18 m

4 2400 m^2

5 400 cm^2

6 5000 kg

7 176 m^2

8 320 m^2

Chapter 8 test

1 **(a)** 2, 5
(b) acute angles, 1, 3, 8
(c) obtuse angles, 4, 6, 7

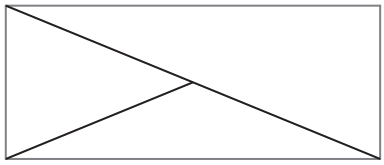
2 **(a)** triangles: 6, 7, 9, 11, 13 acute-angled triangles: 6, 11 right-angled triangles: 7, 9 obtuse-angled triangles: 13
(b) quadrilaterals: 2, 3, 4, 5, 10, 12 rectangles: 3, 10 squares: 10
(c) 1, 8

3 C

4 D C

5 D

6 Various answers possible. For example:



7 **(a)** 1 m 1 m^2
(b) cm m^2
(c) 600 cm^2
(d) equilateral triangle
(e) 4 2

8 **(a)** AC D
(b) E
(c) D
(d) B F

9 **(a)** ✓
(b) ✗
(c) ✗

10 **(a)** D **(b)** B **(c)** B

11 **(a)** 180 m^2 **(b)** 81 m^2

12 isosceles triangle isosceles triangle
One line of symmetry should be drawn on each triangle from the vertex where the two equal sides meet to the centre of the opposite side.

13 **(a)** 9 cm^2 **(b)** 13.5 cm^2

14 **(a)** 4140 cm^2
(b) 300 000 cm^2 or 30 m^2
(c) 1200 cm^2
(d) 256 m^2

Chapter 9 Geometry and measurement (II)

9.1 Converting between kilometres and metres

1 **(a)** 8000 **(b)** 1600 **(c)** 100
(d) 0.7 **(e)** 4 **(f)** 470
(g) 5250 **(h)** 4026 **(i)** 9
(j) 1780 **(k)** 16 000 **(l)** 500

2 **(a)** km **(b)** m **(c)** km
(d) m **(e)** km

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

4 **(a)** 4 km < 4545 m < 5 km < 5454 m
(b) 9 km < 10 000 m < 20 202 m < 20 220 m

5 **(a)** 3000 m
(b) **(i)** 292 m **(ii)** 6332 m

6 **(a)** 14 000 m per minute, 233.3 m per second
(b) 18 km per hour

9.2 Perimeters of rectangles and squares (1)

1 **(a)** 40 cm **(b)** 22 cm

2 **(a)** 74 cm, 210 cm^2
180 cm, 2000 cm^2
14 m (or 1400 cm),
6 m^2 (or 60 000 cm^2)
(b) 60 cm, 225 cm^2
12 m, 144 m^2

3 Perimeter = 90 m, Area = 200 m^2

4 100 m

5 150 m

6 550 cm^2, 1650 cm^2

7 Columns can be in any order, but table should be completed as follows:

Length (cm)	1	2	3	4	5	6
Width (cm)	11	10	9	8	7	6
Perimeter (cm)	24	24	24	24	24	24
Area (cm^2)	11	20	27	32	35	36

No, the rectangles do not all have the same area.
When the perimeters of rectangles are equal, the nearer the length and width are to being equal, the greater the area will be.

9.3 Perimeters of rectangles and squares (2)

1 **(a)** 92 m **(b)** 60 cm

2 **(a)** 150 cm, 13 500 cm^2
23 cm, 84 cm
50 m (or 5000 cm),
144 m^2 (or 1 440 000 cm^2)
(b) 96 cm, 576 cm^2
25 cm, 625 cm^2

3 Appropriate diagram drawn. 96 cm, 320 cm^2

4 110 m

5 17 cm

6 **(a)** 2
(b) Perimeter of 6 × 48 rectangle = 108 cm, Perimeter of 12 × 24 rectangle = 72 cm

7 1st square – area: 225 cm^2 perimeter: 60 cm
2nd square – area: 25 cm^2 perimeter: 20 cm
Remaining piece – area: 50 cm^2 perimeter: 30 cm

9.4 Perimeters and areas of rectilinear shapes

1 **(a)** 24 cm, 20 cm^2 **(b)** 24 cm, 24 cm^2
(c) 32 cm, 28 cm^2 **(d)** 28 cm, 24 cm^2

2 **(a)** 200 cm, 1000 cm^2
(b) 150 cm, 850 cm^2

3 242 cm^2

4 729 cm^2

5 36 cm^2

6 **(a)** 234 cm^2
(b) 72 cm

7 Appropriate diagram drawn. 8500 cm^2

8 144 cm^2

9.5 Describing positions on a 2-D grid

1 Lines drawn from Lou to seat 6 in Row 2 and from Ella to seat 3 in Row 4.

2 horizontally, vertically

3 Tiger (3, 3)
Rabbit (4, 4) Horse (4, 2)
Sheep (7, 3) Monkey (8, 5)
Cat (9, 1) Dog (10, 2)

4 Marks correctly placed in the grid.

5 **(a)** (4, 5)
(b) Various answers possible. All routes must take the snail from (2, 9) to end on (4, 5). For example, it can move 4 squares down, and then move 2 squares right.

6 **(a)** (9, 1) **(b)** 495

9.6 Solving problems involving time and money (1)

1 **(a)** 12
(b) 365, 366
(c) 28, 29
(d) 90 days (for leap years this answer will be 91)

2 **(a)** 60, 3600 **(b)** 90
(c) 45, 2700 **(d)** $\frac{3}{4}$
(e) 3, 10 **(f)** 60
(g) 21, 504 **(h)** 6

3 **(a)** Either 9:09 a.m. or 9:09 p.m. Either 09:09 or 21:09
(b) 4:28 p.m. 16: 28
(c) Either 1:24 a.m. or 1:24 p.m. Either 01:24 or 13:24
(d) 11:31 p.m. 23: 31

4 20:45 (also accept 8:45 p.m.)

5 **(a)** **(i)** 13 **(ii)** 91
(b) **(i)** £1235 **(ii)** £8645
(c) **(i)** £364 **(ii)** £2548 **(iii)** £267 540

6 2, 24

7 **(a)** 15 × 181 = 2715 (kWh) (Answer may be 2730 if it is a leap year)
(b) 12 × 15 = 180p = £1.80
12 × 15 × 181 = 32 580 p = £325.80

9.7 Solving problems involving time and money (2)

1 **(a)** 100 **(b)** 10 **(c)** 0.6 **(d)** 75
(e) 8, 90 **(f)** 0.01 **(g)** 8050 **(h)** 238

2 **(a)** 6 **(b)** 3 **(c)** 648

3 12 × 4 + 4 × 75 = 348 (pounds)

4 **(a)** 2512 × 12 = 30 144 (pounds)
(b) Estimation may vary.
Calculate: 9.5 × 8 × 5 = 380 (pounds)
Difference will depend on original estimation
(c) More than half of Erin's monthly salary

5 **(a)** £258, £1806
(b) £1806

6 6 × 80 × 0.99 = 475.20 (pounds)

7 15 × 30 × 14 = 6300 (pounds) 6500 – 6300 = 200 (pounds)
The budget is £200 more than the total purchase price.

Chapter 9 test

1 **(a)** 90
(b) 3, 500
(c) 1.6
(d) km
(e) the side length
(f) the length, the width
(g) 12, 720
(h) 2.5, 2, 50

2 **(a)** 3.6, 360
(b) 320 cm
(c) 20 m, 18 m^2

3 **(a)** 24 m 50 cm 12 cm
(b) 96 m 6 m 360 cm

4 **(a)** ✗ **(b)** ✗ **(c)** ✗ **(d)** ✓

5 Perimeter: 52 cm, Area: 88 cm^2

6 (8, 5)

7 **(a)** 6300 m, 6.3 km **(b)** 625 cm^2
(c) 300 m^2 **(d)** 876 m^2
(e) Square A: 784 cm^2
Square B: 400 cm^2
(f) **(i)** £69 **(ii)** £71
(g) **(i)** 84 **(ii)** £175, £2100
(h) **(i)** 420 **(ii)** 5040p, £50.40

Chapter 10 Four operations of whole numbers

10.1 Calculating work rate (1)

1 Miss Kaur was the fastest. Compare their work rate (number of toys made per day).

2 **(a)** ÷
(b) × time taken
(c) ÷ work rate

3 **(a)** 132 ÷ 4 = 33 (pages per day)
(b) 32 × 5 = 160 (mental calculations)
(c) 480 ÷ 30 = 16 (hours)
(d) 270 ÷ 3 = 90, 400 ÷ 5 = 80 Aaron has a higher work rate.

4 144 ÷ (216 ÷ 3) = 2 (minutes)

5 1200 ÷ 30 – 1200 ÷ 40 = 10 (metres)

10.2 Calculating work rate (2)

1 **(b)** 1000 ÷ 50 = 20 (hours) They need 20 hours to make 1000 clay pots.
(c) 288 ÷ 6 = 48 (friendship bands)
They made 48 friendship bands every hour.

2 **(a)** (18 + 4) × 22 = 484 (kilowatt-hours)
(b) 18 ÷ 3 = 6 (bags) 14 ÷ 2 = 7 (bags) 20 ÷ 4 = 5 (bags)
Mr. Lee made the most bags per hour.
(c) (6480 ÷ 8) + 6480 = 7290 (toys)

3 **(a)** 9600 ÷ 4 = 2400 (books)
(b) 9600 ÷ (4 × 30) = 80 (books)
(c) 9600 ÷ 20 = 480 (books)
(d) 9600 ÷ (4 × 30 × 20) = 4 (books)

10.3 Solving calculation questions in 3 steps (1)

1 **(a)** 5 × 4 = 20
(b) 9 + 15 = 24
(c) 4 × 4 = 16
(d) 16 + 11 = 27

2 **(a)** 24 **(b)** 14 **(c)** 15 **(d)** 13
(e) 3 **(f)** 24 **(g)** 13 **(h)** 24
(i) 1

3 **(a)** (6 – 5 + 2) × 8 = 24
(b) Various answers possible.
[8 – (11 – 9)] × 4 = 24
(11 – 4) + 8 + 9 = 24

4 **(a)** 4 × 2 × (6 – 3) = 24
(b) 3 × (6 + 4 – 2) = 24
(c) 3 × 6 + 2 + 4 = 24
(d) 2 × 6 + 3 × 4 = 24 (Answers may vary)

5 Some answers may vary, depending on the order chosen. For example:
(a) $(7 \times 7 - 1) \div 2 = 24$
(b) $6 + (2 \times 7) + 4 = 24$
(c) $12 \times [4 - (8 - 6)] = 24$
(d) $(13 - 1) \times (12 - 10) = 24$

6 **(a)** $4 \times 4 + 4 + 4$ **(b)** $5 \times 5 - 5 \div 5$
(c) No **(d)** No
(e) $12 + 12 \times (12 \div 12)$

7 **(a)** 9 **(b)** 4 **(c)** 6
(d) 5, 1 **(e)** 3, 8 **(f)** 7, 2

10.4 Solving calculation questions in 3 steps (2)

1 **(b)** $182 \div (28 - 14) = 13$
(c) $(128 + 72) \div (20 \times 5) = 2$

2 **(a)** D **(b)** B

3 **(a)** $650 \div 50 + 45 + 60 = 118$
(b) $35 \times 6 - 121 \div 11 = 199$

4 **(a)** division, division, addition
$462 \div 3 = 154$, $66 \div 22 = 3$, $154 + 3 = 157$
(b) division, division, subtraction
$480 \div 20 = 24$, $24 \div 3 = 8$, $66 - 8 = 58$
(c) multiplication, division, addition
$150 \times 24 = 3600$, $3600 \div 30 = 120$, $947 + 120 = 1067$
(d) division, subtraction, addition
$2600 \div 8 = 325$, $994 - 325 = 668$, $668 + 549 = 1217$

5 $142 \div 2 - 7 \times 9 + 2 = 10$

6 $(120 + 20) \div 2 = 70$ (cm)

10.5 Solving calculation questions in 3 steps (3)

1 **(a)** $(45 - 20) + 650 \div 50 = 38$
(b) $(121 + 11) \div (35 - 23) = 11$

2 **(a)** division, subtraction, addition
$0 \div 24 = 0$, $24 - 0 = 24$, $24 + 24 = 48$
(b) subtraction, division, addition
$240 - 200 = 40$, $240 \div 40 = 6$, $240 + 6 = 246$
(c) division, addition, division
$36 \div 36 = 1$, $39 + 1 = 40$, $160 \div 40 = 4$
(d) subtraction, addition, multiplication
$450 - 133 = 317$, $317 + 23 = 340$, $340 \times 18 = 6120$
(e) multiplication, multiplication, division
$8 \times 5 = 40$, $44 \times 60 = 2640$, $2640 \div 40 = 66$
(f) subtraction, division, subtraction
$307 - 227 = 30$, $330 \div 30 = 11$, $205 - 11 = 194$

3 **(a)** multiplication and division, addition and subtraction
(b) the calculation in the brackets
(c) multiplication, subtraction, division

4 **(a)** $(42 + 567) \div 40 = 15$ (coaches) r 9 (people)
So, 16 coaches are needed.
(b) **(i)** $360 \div (34 - 22) = 30$ (kilograms)
(ii) $360 \div (34 - 22) \times (34 + 22) = 1680$ (kilograms)
(iii) $(34 + 22) \times 80 = 4480$ (pounds)

5 $(480 - 360) \div (12 + 8) = 6$
$480 - 360 \div (12 + 8) = 462$

6 $(724 - 88) \div 2 \div 3 = 106$ (books)

10.6 Solving calculation questions in 3 steps (4)

1 $27 \times [2520 \div (37 + 53)] = 756$

2 **(a)** $660 \div [(247 - 82) \times 2] = 2$
(b) $[1000 - (70 + 20)] \times 2 = 1820$

3 **(a)** round brackets, square brackets, 20
(b) division, multiplication
(c) division, addition, subtraction, multiplication
(d) multiplication, addition, subtraction, 3400
(e) 2×1000, $2000 + 550$, $2550 - 1100$, 1450

4 **(a)** division, subtraction, subtraction
$4160 \div 20 = 208$, $208 - 86 = 122$, $155 - 122 = 33$
(b) subtraction, multiplication, addition, division
$56 - 32 = 24$, $24 \times 16 = 384$, $846 + 384 = 1230$, $1230 \div 30 = 41$
(c) addition, subtraction, division
$560 + 40 = 600$, $800 - 600 = 200$, $8000 \div 200 = 40$
(d) subtraction, division, subtraction
$301 - 281 = 20$, $4020 \div 20 = 201$, $3205 - 201 = 3004$
(e) addition, subtraction, division
$79 + 101 = 180$, $3180 - 180 = 3000$, $3000 \div 40 = 75$
(f) subtraction, division, division
$2200 - 1480 = 720$, $720 \div 8 = 90$, $2430 \div 90 = 27$

5 **(a)** $21 - (21 - 15) \times 3 = 3$ (kilograms)

10.7 Working forwards

1 Tree diagram completed from top to bottom as follows: $24 \div 3$, $8 + 14$, 22×9
Output = 198 $(24 \div 3 + 14) \times 9 = 198$

2 **(a)** 200, 82, 164
$(1000 \div 5 - 118) \times 2 = 164$
(b) 393, 24, 3
$(1285 - 892 - 369) \div 8 = 3$

3 **(a)** $(17 + 2) \times 2 - 2 = 36$
(b) $(71 - 15 \times 2) \times 24 = 984$

4 **(a)** $12 - 2 + 6 - 3 + 4 = 17$ (passengers)
(b) $360 \times 3 + 32 = 1112$ (chickens)

5 $(68 \div 2 + 8) \div 3 = 14$ (years old)

6 $(54 \times 2 - 36) \div 4 = 18$ (goals)

10.8 Working backwards

1 8, 1, 9 $(72 \div 8 - 8) \times 8 = 8$

2 **(a)** $79 \longrightarrow 113 \longrightarrow 339 \longrightarrow 149$
$79 + 34 \times 3 - 190 = 149$
(b) $2093 \longrightarrow 91 \longrightarrow 15 \longrightarrow 750$
$2093 \div 23 - 76 \times 50 = 750$

3 **(a)** $160 \div 8 - 8 = 12$
(b) $(45 \times 8 - 20) \div 5 = 68$

4 **(a)** $(100 \div 20 + 14) \times 3 - 4 = 53$ (years old)
(b) $(7 \times 7 - 7) \div 7 + 7 = 13$ (apples)

5 $(48 + 24) \times 5 \div 8 = 45$

6 $[(13 + 5) \times 2 + 6] \times 2 = 84$ (pages)

10.9 Word calculation problems (1)

1 **(a)** Product = Quotient, 12 $150 \div 6 \times 12 = 300$
(b) Quotient = Sum, $\div 30$ $(288 + 42) \div 30 = 11$

2 **(a)** C **(b)** B **(c)** A **(d)** D

3 **(a)** $600 \div 20 + 187 = 217$
(b) $500 \times 32 \div 100 = 160$
(c) $470 \times 15 - 17 \times 104 = 5282$
(d) $244 \div (244 \div 2 - 118) = 61$
(e) $1098 - 756 \div 2 = 720$

4 $820 \times 208 = 170\,560$

5 $(37 - 9) \div (3 - 1) = 14$ (years old)

10.10 Word calculation problems (2)

1 **(a)** Product = Quotient × Difference
$210 \div 7 \times (120 - 80) = 1200$
(b) Sum = Product + Quotient
$34 \times 12 + 48 \div 12 = 412$

2 **(a)** $(66 \times 25) \div (6 \times 5) = 55$
(b) $2940 - 2940 \div 20 = 2793$
(c) $128 \times 50 + 36 = 6436$
(d) $2 \times 72 - 6300 \div 60 = 39$

3 **(a)** C **(b)** A **(c)** D **(d)** B

4 **(a)** the difference between the product of 403 multiplied by the difference of 213 subtracted by 90 and 13
Answer: 49 556
(b) the quotient of 864 divided by the quotient of the difference between 2193 and 1473 divided by 90
Answer: 108

5 (1000 − 456) ÷ 4 = 136

10.11 Laws of operations (1)

1 **(a)** order, unchanged, *b*, *a*
(b) order, unchanged, *b*, *a*
(c) unchanged, *b*, *c*
(d) unchanged, *b*, *c*

2 **(a)** 732
(b) 621, 248
(c) 14
(d) 250 and 4 in either position
(e) ★ ▲
(f) ◆ ●
(g) *y*, *z*
(h) *k*, *l*

3 Column method used correctly.
Answers checked appropriately using commutative law.
(a) 2575 **(b)** 1543
(c) 8151 **(d)** 34 983

4 **(a)** 169 + 500 = 669
(b) 923 + 200 = 1123
(c) 75 × 100 = 7500
(d) 100 × 34 = 3400
(e) 510 + 800 = 1310
(f) 91 × 1000 = 91 000

5 **(a)** 1000 − 400 = 600
(b) 2000 × 6 = 12 000
(c) 1 000 000 + 100 000 + 10 000 + 1000 + 100 + 10 = 1 111 110

10.12 Laws of operations (2)

1 **(a)** 80 **(b)** 25 **(c)** 44, 56
(d) b, a **(e)** b, c **(f)** b, c
(g) 33, 84 **(h)** ■ ▲
(i) 75, 2, 8, 125 (other orders acceptable)

2 **(a)** 200 + 100 = 300
(b) 1000 × 100 = 100 000
(c) 100 × 16 = 1600
(d) 6000 × 9 = 54 000
(e) 1000 × 11 = 11 000
(f) 1000 × 100 × 7 = 700 000

3 **(a)** (6 × 4) × 25 = 600 (pounds) or 6 × (4 × 25) = 600 (pounds)
(b) 40 ÷ 5 ÷ 4 = 2 (pounds) or 40 ÷ 4 ÷ 5 = 2 (pounds) or 40 ÷ (5 × 4) = 2 (pounds)
(c) 2 × (8 × 25) = 400 (flowers) or (2 × 8) × 25 = 400 (flowers)

4 **(a)** 10 000 × 32 = 320 000
(b) 7

10.13 Laws of operations (3)

1 **(a)** C
(b) B
(c) A
(d) Number sentences should demonstrate distributive law
(e) $a \times (b + c) = a \times b + a \times c$
$a \times (b - c) = a \times b - a \times c$

2 **(a)** 64, 49, + **(b)** ■, ×
(c) 15, 42, 35 **(d)** −, *a*, *d*
(e) 55 × (22 − 11) **(f)** +, 73

3 **(a)** ✗ **(b)** ✗ **(c)** ✓
(d) ✗ **(e)** ✓ **(f)** ✓

4 **(a)** 78 × 100 = 7800
(b) 24 × 100 = 2400
(c) 100 + 80 = 180
(d) 10 000 − 2400 = 7600
(e) 56 × 57 = 3192
(f) 100 × 45 = 4500
(g) 43 × 100 − 43 = 4257
(h) 207 × 100 + 207 = 20 907

5 150 (Hint: 50 × 4 − 50 = 150)

10.14 Laws of operations (4)

1 **(a)** the commutative law of addition and associative law of addition
(b) the associative law of multiplication
(c) the distributive law of multiplication over addition
(d) distributive law of multiplication over subtraction

2 Two different methods used to simplify each calculation. Answers are as follows:
(a) 1200 **(b)** 8000 **(c)** 19 899

3 **(a)** 59 × 100 + 59 = 5959
(b) 35 × 100 = 3500
(c) 200 × 6 = 1200
(d) 21 × 100 = 2100
(e) 300 × 125 = 37 500
(f) 100 × 1000 = 100 000

4 **(a)** 12 × (32 + 18) = 600 (passengers)
(b) (30 + 4) × 25 = 850 (kilograms)

5 **(a)** 1000 × 36 = 36 000
(b) 1 000 000

10.15 Problem solving using four operations (1)

1 **(a)** 1200 ÷ 40 = 30 (metres per day)
(b) 30 + 10 = 40 (metres per day)
(c) 1200 ÷ 40 = 30 (days)

2 **(a)** 91 × 10 ÷ 7 = 130 metres actually built each day
91 × 10 ÷ 7 − 91 = 39 metres more than planned
(b) 81 × 10 ÷ (81 + 9) = 9 days taken to complete
10 − 9 = 1 day
(c) 360 ÷ 60 − 360 ÷ 90 = 2 days earlier
(d) 360 ÷ 4 − 360 ÷ 6 = 30 pages more than planned
(e) 3000 ÷ 20 − 3000 ÷ 30 = 50 kilograms fewer
(f) 135 ÷ 3 − 126 ÷ 3 = 3 more bounces per minute

3 3600 ÷ (3600 ÷ 30 + 3600 ÷ 20) = 12 (days)

4 (25 × 15 − 25 × 3) ÷ 10 − 25 = 5 (people)

10.16 Problem solving using four operations (2)

1 **(a)** B **(b)** A

2 **(a)** Method 1: (1620 − 60 × 9) ÷ 60 = 18 (days)
Method 2: 1620 ÷ 60 − 9 = 18 (days)
(b) Method 1: 56 ÷ 4 × 8 = 112 (toys)
Method 2: 56 × (8 ÷ 4) = 112 (toys)

3 **(a)** (460 − 120) ÷ (120 ÷ 6) = 17 (days)
(b) 82 800 − (82 800 ÷ 60 × 44) = 22 080 (square metres)
(c) (4920 − 2400) ÷ (2400 ÷ 20) = 21 (days)
(d) 600 ÷ 8 ÷ (100 ÷ 5 ÷ 4) = 15 (workers)

4 C

5 Price of a chair: 2400 ÷ (20 × 3 + 40) = 24 (pounds)
Price of a desk: 24 × 3 = 72 (pounds)

10.17 Problem solving using four operations (3)

1 **(a)** 10 × (16 ÷ 8) = 20 (pounds)
(b) 36 × (270 ÷ 10) = 972 (pounds)
(c) 2 × (12 ÷ 3) + 3 × (25 ÷ 5) = 23 (pounds)
(d) 2 × (12 ÷ 3) + 4 × (16 ÷ 8) = 16 (pounds)

2 **(a)** (120 ÷ 8) × 24 + 120 = 480 (computers)
(b) (680 − 65 × 4) ÷ 6 = 70 (items)
(c) 240 + (240 × 2 + 8) = 728 (kilometres)
(d) (150 + 50) × 3 − 20 = 580 (trees)

3 120

4 Mum: (78 − 11 + 2) ÷ 3 = 23 (apples)
Dad: 23 + 11 = 34 (apples)
Ben: 23 − 2 = 21 (apples)

10.18 Problem solving using four operations (4)

1 **(a)** 600 ÷ (160 ÷ 8) = 30 (minutes)
(b) 126 + 12 × (126 ÷ 9) = 294 (tiles)
(c) (255 − 37 × 5) ÷ 2 = 35 (pages)
(d) (7 × 60) × (60 ÷ 30) = 840 (kilometres)

2 **(a)** (200 − 137) ÷ 10 = 6 r.3 6 pens can be bought
(b) 100 000 ÷ 2 ÷ (75 000 ÷ 3 ÷ 5) = 10 (lorries)
(c) (900 ÷ 30 − 5) × 25 = 625 (kilograms)
(d) The number of sweaters in each cardboard box: 480 ÷ (2 × 2 + 8) = 40 (sweaters)
The number of sweaters in each plastic box: 40 × 2 = 80 (sweaters)

3 One plate: (87 − 39) ÷ (6 − 2) = 12 (pounds)
One bowl: (87 − 12 × 6) ÷ 3 = 5 (pounds) or (39 − 12 × 2) ÷ 3 = 5 (pounds)

4 Child B: (108 + 18 − 12) ÷ 3 = 38 (pictures)
Child A: 38 − 18 = 20 (pictures)
Child C: 38 + 12 = 50 (pictures)

Chapter 10 test

1 **(a)** 120 **(b)** 100 **(c)** 1000
(d) 5 **(e)** 1 **(f)** 162
(g) 101 **(h)** 800 **(i)** 7000

2 **(a)** 125 460 Answer should be checked by pupil.
(b) 4389

3 Appropriate methods should be used
(a) 2500 **(b)** 50 500
(c) 4092 **(d)** 9000
(e) 880 000 **(f)** 101 000
(g) 640 **(h)** 1800

4 **(a)** commutative law of multiplication, associative law of multiplication
(b) commutative law of addition
(c) (◆ + ●) × ★ **(d)** 84, 33
(e) 27 18 **(f)** 9001
(g) 46 **(h)** 1
(i) 10 **(j)** 19
(k) 63 **(l)** 4500
(m) greater than
(n) amount of work, time taken

5 **(a)** ✗ **(b)** ✗ **(c)** ✓ **(d)** ✓

6 **(a)** (240 ÷ 20 + 79) × 36 = 3276
(b) [(144 × 5) + 250] × 10 = 9700

7 **(a)** (1100 − 2) ÷ 18 = 61
(b) 840 ÷ (129 − 59) × 66 = 792
(c) (19 − 5) ÷ 7 + 3 = 5

8 **(a)** (720 − 240) ÷ (240 ÷ 3) = 6 (hours)
(b) 120 ÷ (120 ÷ 12 − 2) = 15 (containers)
(c) 60 × 110 ÷ 100 − 60 = 6 (sets)
(d) (1125 − 185) ÷ 20 = 47 (kilograms)

End of year test (Practice Book 4B, pages 160–167)

1 **(a)** 99 **(b)** 3500 **(c)** 144
(d) 30 **(e)** 40 **(f)** 391
(g) 200 **(h)** 6000 **(i)** 0
(j) 4239 **(k)** 21 **(l)** 120

2 **(a)** 5474 **(b)** 39 232
(c) 7001 Answer checked appropriately by pupil.

3 **(a)** 9500 **(b)** 5600 **(c)** 880
(d) 1 **(e)** $\frac{5}{8}$ **(f)** 0

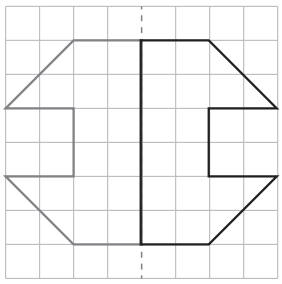
4 **(a)** 201 × 37 + 17 = 7454
(b) 18 × 45 − 36 = 774

5 **(a)** 0.48 **(b)** 45
(c) 25, 350, 25 350 **(d)** 9889
(e) 9 **(f)** 6
(g) $\frac{91}{100}$ **(h)** 25
(i) 2, 0, 4 **(j)** 3
(k) 3 **(l)** 4, 16
(m) 66, 94

6 **(a)** ✓ **(b)** ✗ **(c)** ✓
(d) ✗ **(e)** ✗

7 **(a)** B **(b)** A **(c)** C
(d) B **(e)** C

8 **(a)**



(b) 342 cm^2

9 **(a)** 6
(b) 684 pages
(c) **(i)** 30 m **(ii)** 825 m^2
(d) £525
(e) **(i)** line
(ii) Month 6 (June), Month 11 (November)
(iii) Month 4 (April), Month 5 (May), Month 10 (October), Month 11 (November)
(iv) 92