**Answers**

**Test 1 — Pages 2-5**

**Q1**
540 300, 504 030, 54 300, 53 400 (1 mark)

**Q2**
47 350, 47 300, 47 000 (2 marks for all three correct. Otherwise 1 mark for any two correct.)

**Q3**

\[
\begin{array}{c}
6 \times 7 \times 5 \\
5 \times 4 \times 2 \\
2 \times 5 \\
\end{array}
\]

\[
\begin{array}{c}
\frac{3}{8} \\
\frac{4}{5} \\
\frac{6}{5} \\
\end{array}
\]

(1 mark)

**Q4**
12 = 3 \times 4, so multiply the numerator by 4.
2 \times 4 = 8, so \(\frac{2}{3} = \frac{8}{12}\)
Working from the right-hand fraction to the left:
1 \times 8 = 8, so multiply the right-hand denominator by 8.
2 \times 8 = 16, so \(\frac{8}{16} = \frac{1}{2}\)
(1 mark for both correct.)

\[
\begin{array}{c}
\frac{3}{4} + \frac{1}{2} = \frac{9}{12} + \frac{6}{12} \\
\frac{17}{12} = \frac{15}{12} \\
\end{array}
\]

(1 mark)

**Q5**
12 = \frac{1}{4} \times 18
16 packs (1 mark)

**Q6**
Angles at a point = 360°
so angle x = \(\frac{360°}{5} = 72°\)
(1 mark)

The triangles are isosceles, so angle y and the unmarked angle are equal.
Angles in a triangle = 180°
So \(y + y + 72° = 180°\)
\(2y = 180° - 72° = 108°\)
y = \(\frac{108°}{2} = 54°\) (1 mark)

**Q7**
There are 1\ 1/2 lots of 16 biscuits in 24 biscuits.
So she’ll need 1\ 1/2 lots of 22 squares of chocolate
= \(1 \times 22 + \frac{1}{2} \times 22\)
= \(22 + 11 = 33\) squares
(1 mark)

**Q8**
Height = \(6 \times 3 = 18\) cm
Base = \(4 \times 3 = 12\) cm
(1 mark for both correct)

**Q9**
40 ÷ 5 = 8, \(8 \times 8 = 64\) km
64 × 5 = 320 km
(2 marks for correct answer. Otherwise 1 mark for correct working.)

**Q10**
Volume = \(l \times w \times h\)
= \(12 \times 9 \times 5\)
= \(540\) cm³ (1 mark)

**Q11**
The shape moves 4 units along the top and 6 units up the y-axis. So the new coordinates of \(P\) are
\((1 + 4, 6 + 6) = (5, 12)\)
(1 mark)

**Q12**
10% of \(£290 = £29\)
20% of \(£240 = 2 \times 29 = £58\)
Sale price = \(290 - 58\)
= \(£232\) (2 marks for correct answer. Otherwise 1 mark for calculating 20% correctly.)

**Q13**
\(\frac{f}{d} = 6\) and \(s = 9\), so
\(E = (7 \times 6) + (4 \times 9)\)
= \(42 + 36 = £78\)
(1 mark)

**Q14**
The ‘green’ sector of the pie chart measures 60°.
60 = \(\frac{1}{6}\)
so number of green sweets = \(24 ÷ 6 = 4\)
(1 mark)

**Section One — Number & Place Value**

**Pages 6-7 — Ordering Numbers**

**Q1**
£8 463 700 (1 mark)

**Q2**
Twenty eight million, seven hundred and forty thousand, eight hundred and twenty seven.
(1 mark)

**Q3**
7 000 000
and 50 000 (1 mark)

**Q4**
Redland (1 mark)

**Q5**
70 000 (1 mark)

**Q6**
15 024 888, 15 024 764,
15 023 223, 15 023 096
(1 mark)

**Q7**
98 875 433 (1 mark)
33 457 898 (1 mark)

**Pages 8-9 — Negative Numbers**

**Q1**
5 – 8 = –3
–3 + 12 = 9 (1 mark)

**Q2**
To get each term of the sequence, you subtract 15 from the previous term.
5 – 15 = –10
–10 – 15 = –25 (1 mark)

**Q3**
–2 + 18 = 16 (1 mark)

**Q4**
–5 – 13 = –18
–12 + 9 = –3 (1 mark)

**Q5**
Work out the places to 0, then the places after 0.
–6 + 6 = 0
0 + 11 = 11
6 + 11 = 17 °C (1 mark)

**Q6**
It takes £88 to get to £0:
–£88 + £88 = £0
That leaves
£150 – £88 = £62
So –£88 + £150 = £62
(1 mark)

Work out the places to 0, then the places after 0.
–28 + 28 = 0
0 + 32 = 32
28 + 32 = £60
(1 mark)

**Q7**
–8 + 3 = –5
–17 = –10 – 7 (1 mark)

**Q8**
–50 – 18 = –68
–14 + 18 = 4
(1 mark for both correct.)

**Pages 10-11 — Rounding**

**Q1**
25 500 and 509 000 (1 mark)

**Q2**
78 705 rounded to the nearest hundred is 78 700.
(1 mark)
987 537 rounded to the nearest ten thousand is 990 000.
(1 mark)

**Q3**
9000 + 7000 = 16 000
(1 mark)

**Q4**
18 000 000
29 000 000 (1 mark)

**Q5**
3.55 (1 mark)

**Q6**
25.5 and 50.0 (1 mark)
Answers

Q6 \[ \begin{array}{c}
\frac{4723}{61} \\
4723 \\
2833180 \\
289103
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

\[ \begin{array}{c}
3816 \\
44 \\
152640 \\
167904
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Q7 4404 ÷ 12 = 367 (2 marks for the correct answer. Otherwise 1 mark for long division with no more than one error.)

Q6 Sample working:
\[ \begin{array}{c}
27r3 \\
15 \] 408 \\
-30 \\
108 \\
-105
\end{array} \]

So she can make 27 bracelets (1 mark). She will have 3 cm left over (1 mark).

Q7 The remainder is 2.

\[ \begin{array}{c}
345r2 \\
22 \] 7592 \\
-66 \\
99 \\
-88 \\
112 \\
-110
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for long division with no more than one error.)

Q8 The teacher will get 14 sweets.

\[ \begin{array}{c}
132r14 \\
29 \] 3842 \\
-29 \\
94 \\
-87 \\
72 \\
-58 \\
14
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for long division with no more than one error.)

Pages 12-13 —
Written Multiplication
Q1 20 \times 1500 = 30000 (1 mark)
Q2 27
\times 15 \\
135 \\
270 \\
405 (1 mark)
Q3 374
\times 23 \\
1122 \\
7480 \\
8602 (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Q4 365
\times 16 \\
2190 \\
3600 \\
5840 (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Q5 169
\times 24 \\
6776 \\
3380 \\
4056 (1 mark)
\times 87 \\
15 \\
435 \\
870 (1 mark)

Q6
\[ \begin{array}{c}
4723 \\
2833180 \\
289103
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

\[ \begin{array}{c}
3816 \\
44 \\
152640 \\
167904
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Pages 14-15 —
Written Division
Q1 486 should be circled (1 mark)
Sample working:
\[ \begin{array}{c}
486 \\
9 \] 4374
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Q2 756 ÷ 12 = 63 (1 mark)
Sample working:
\[ \begin{array}{c}
63 \\
12 \] 77516
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Q3 68
\times 11 \] 7748
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

\[ \begin{array}{c}
694 \\
557512
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Q4 6384 ÷ 21 = 304
\[ \begin{array}{c}
304 \\
21 \] 6384
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

\[ \begin{array}{c}
6384 \\
6384
\end{array} \] (2 marks for the correct answer. Otherwise 1 mark for working using long multiplication with no more than one error.)

Pages 16-17 —
Multiplying and Dividing
with Decimals
Q1 6.82 \times 100 = 6820
6.82 ÷ 10 = 0.682
6.82 \times 100 = 682
6.82 ÷ 100 = 0.682
(1 mark for all lines drawn correctly)
Answers

Pages 18-19 — Order of Operations

Q1 26 and 10 (1 mark)

Q2 8 + 2 x 8 and (7 + 5) x 2 = 24
9 + 3 - 6 and 9 - 3 x 4 = -3
8 + 8 x 4 and (5 x 6) + 3 = 10
(2 marks for all three pairs correct. Otherwise 1 mark for linking one pair correctly.)

Q3 6 x 14 + 21 = 4
(2 marks for the correct answer. Otherwise 1 mark for calculating the total number of biscuits as 84.)

Q4 2 x 3 = 6 packets a day
6 x 7 = 42 packets a week
42 ÷ 7 = 6 packets a week
So she will need 9 boxes.
(2 marks for the correct answer. Otherwise 1 mark for calculating the number of packets used each week.)

Q5 Work out how much a sausage roll costs:
£3.24 + 26 = £1.24
Find the cost of 17 sausage rolls:
£1.24 x 17 = £21.08
(2 marks for the correct answer. Otherwise 1 mark for calculating the price of one sausage roll.)

Q6 The cost of one of each item:
24p + 70p + 35p = £1.29
Cost of six of each:
£1.29 x 6 = £7.74
Change from £10:
£10 - £7.74 = £2.26
(2 marks for the correct answer. Otherwise 1 mark for some correct working.)

Q7 12 x 19p = 228p
£5 = 500p
500p - 228p = 272p
272 ÷ 12 = 22
So she could buy 12 apples.
(2 marks for the correct answer. Otherwise 1 mark for finding the amount spent on yoghurts.)

Pages 21-22 — Factors, Multiples and Primes

Q1 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, 72 (1 mark)

Q2 24, 48 and 72 should be circled. (1 mark)

Q3 41, 43, 47
(2 marks for the correct answers. Otherwise 1 mark for two correct numbers.)

Q4 Factors of 36:
1, 2, 3, 4, 6, 9, 12, 18, 36
Factors of 54:
1, 2, 3, 6, 9, 18, 27, 54
Common factors:
1, 2, 3, 6, 9, 18
(2 marks for all six correct common factors. Otherwise 1 mark for finding all the factors of 36 or of 54.)

Q5 3 x 5 x 7 = 105 (1 mark)

Q6 Multiples of 6:
6, 12, 18, 24, 30, 36, 42, 48
Multiples of 9:
9, 18, 27, 36, 45
So the common multiples are 18 and 36 (1 mark).

Q7 Factors of 52: 1, 2, 4, 13, 26, 52. So Geoff could be thinking of 2 or 13.
(2 marks for both correct values. Otherwise 1 mark for one correct value.)

Q8 Factors of 28:
1, 2, 4, 7, 14, 28
1 + 2 + 4 + 7 + 14 = 28
So, 28 is a perfect number.
(1 mark)

Q9 Sample answer: 2 + 3 = 5
(1 mark for adding 2 to any other prime number.)

Page 20 — Estimation and Accuracy

Q1 You’d estimate the answer to be about 800 + 40 = 20,
so 21.1 should be circled.
(1 mark)
Section Three — Fractions, Decimals & Percentages

Page 43 — Fractions

Q1 6 and $\frac{8}{12}$ should be circled (1 mark)

Q2 $\frac{5}{8} = \frac{3}{2} = \frac{12}{21} = \frac{5}{18} = \frac{45}{42}$

(2 marks for all three correct, otherwise 1 mark for two correct.)

Q3 $\frac{12}{9} = \frac{2}{11} = \frac{3}{8} = \frac{121}{88} = \frac{11}{8}$

(2 marks for all three correct, otherwise 1 mark for two correct.)

Q4 Pippa has shaded $\frac{9}{20}$ squares. $\frac{2}{5} = \frac{20}{45}$ so Kai needs to shade 45 squares (1 mark)

Q5 E.g. 36 is a common multiple of 9 and 12.

\(\frac{8}{9} \times \frac{4}{9} = \frac{32}{36}\) (1 mark),

\(\frac{13}{12} \times \frac{3}{12} = \frac{39}{36}\) (1 mark).

Page 24 — Comparing Fractions

Q1 Make equivalent fractions with the same denominator:

\(\frac{5}{3} = \frac{24}{18}\), \(\frac{6}{15}\), \(\frac{10}{15}\), \(\frac{20}{18}\), \(\frac{9}{18}\)

and \(\frac{17}{18}\). So the order is:

\(\frac{5}{15}\), \(\frac{6}{18}\), \(\frac{10}{18}\), \(\frac{20}{18}\), (1 mark)

Q2 Make equivalent fractions with the same denominator:

\(\frac{3}{27}\), \(\frac{6}{54}\), \(\frac{12}{54}\), \(\frac{24}{54}\), \(\frac{30}{54}\)

and \(\frac{27}{54}\). So the order is:

\(\frac{3}{18}\), \(\frac{6}{18}\), \(\frac{12}{18}\), (1 mark)

Q3 \(\frac{12}{10} = \frac{10}{8} = \frac{10}{8} = \frac{52}{25}\)

(2 marks for the correct answer. Otherwise 1 mark for putting fractions over a common denominator.)

\(\frac{2}{40}\) of a litre

Q4 \(\frac{12}{4} + \frac{12}{4} = \frac{7}{4} + \frac{7}{4}\)

= \(\frac{21}{12} + \frac{14}{12}\) = \(\frac{35}{12}\) = \(\frac{211}{12}\)

(2 marks for the correct answer. Otherwise 1 mark for correct working.)

Q5 \(\frac{2}{9} + \frac{5}{12} = \frac{8}{36} + \frac{15}{36} = \frac{23}{36}\)

\(\frac{1-23}{36} = \frac{36}{36} = \frac{23}{36}\)

(2 marks for the correct answer, otherwise 1 mark for finding the total amount of bread eaten.)

Page 25 — Multiplying Fractions

Q1 \(\frac{1}{6} \times \frac{1}{4} = \frac{1}{24}\)

\(\frac{11}{5} \times \frac{1}{5} = \frac{1}{11}\) (1 mark for both correct)

Q2 \(\frac{4}{9} \times \frac{2}{9} = \frac{8}{81}\) (1 mark)

Q3 \(\frac{2}{5} \times \frac{3}{4} = \frac{6}{20} = \frac{3}{10}\) (1 mark)

Q4 \(\frac{4}{5} \times \frac{1}{3} = \frac{4}{15}\) (1 mark)

E.g. \(\frac{2}{3} \times \frac{4}{7} = \frac{8}{21}\) (1 mark)

Pages 26-27 — Adding and Subtracting Fractions

Q1 \(\frac{2}{3} + \frac{7}{15} = \frac{13}{15}\)

(1 mark)

Q2 \(\frac{1}{3} = \frac{11}{18}\) = \(\frac{12}{18} = \frac{11}{18}\) (1 mark)

Q3 \(\frac{9}{8} = \frac{1}{4} = \frac{5}{40} + \frac{3}{40} = \frac{1}{10}\) (1 mark)

Q4 \(\frac{3}{10} - \frac{5}{8} = \frac{10}{8} = \frac{52}{40} = \frac{25}{40}\)

\(\frac{27}{40}\) of a litre

(2 marks for the correct answer. Otherwise 1 mark for putting fractions over a common denominator.)

Page 28 — Dividing Fractions

Q1 \(\frac{1}{3} \div \frac{8}{3} = \frac{1}{24}\) (1 mark)

\(\frac{1}{10} = \frac{7}{10} = \frac{1}{70}\) (1 mark)

Q2 \(\frac{1}{2} = \frac{1}{6} = \frac{1}{2\times6} = \frac{12}{18}\) (1 mark)

Q3 \(\frac{8}{15} = \frac{4}{5} = \frac{8}{15} = \frac{2}{15}\) (1 mark)

\(\frac{9}{6} = \frac{3}{2} = \frac{6}{3} = \frac{21}{4}\) (1 mark)

Q4 \(\frac{6}{10} = \frac{4}{10} = \frac{6}{40} = \frac{3}{20}\) (1 mark)

Pages 29-30 — Equivalent Fractions and Decimals

Q1 \(\frac{3}{10} = 0.003\)

\(\frac{3}{10} = 0.3\)

\(\frac{3}{1000} = 0.003\) (1 mark)

Q2 \(\frac{0.007}{1000} = \frac{19}{100} = 0.19\)

\(\frac{157}{1000} = 0.157, 0.81 = \frac{81}{100}\) (2 marks for all four correct, otherwise 1 mark for two or three correct.)
### Answers

### Section Four — Ratio, Proportion & Algebra

#### Pages 33-35 — Ratio and Proportion

| Q1 | 7 x 50 g = 350 g (1 mark) |
| Q2 | 345 ÷ 15 = 23 litres (1 mark) |
| Q3 | 24 ÷ 4 = 6 boxes £3.60 x 6 = £21.60 (1 mark) |
| Q4 | £2.40 ÷ 6 = £0.40 (1 mark) 4 x £0.40 = £1.60 (1 mark) |
| Q5 | 7 : 3 (1 mark) There are 4 triangles and 6 squares, so for every 2 triangles there are 3 squares. (1 mark) |
| Q6 | 48 ÷ 12 = 4 (1 mark) 11 x 12 = 132 (1 mark) |
| Q7 | 24 ÷ 3 = 3 (1 mark) |
| Q8 | 27 ÷ 3 = 9 9 x 7 = 63 (1 mark) |
| Q9 | 42 ÷ 6 = 7 Number of girls = 7 x 7 = 49 (1 mark) Number of children = 42 + 49 = 91 (1 mark) |

### Pages 36-37 — Unequal Sharing

| Q1 | There are 1 + 4 = 5 shares. So Ivan gets \( \frac{1}{5} \). (1 mark) |
| Q2 | There are 3 + 2 = 5 shares. 1 share = 35 ÷ 5 = 7 Fleur: 7 x 3 = 21 grapes Bridget: 7 x 2 = 14 grapes (1 mark) |
| Q3 | There are 4 + 3 = 7 shares. 1 share = 63 ÷ 7 = 9 Roger: 9 x 3 = 27 points. (1 mark) |
| Q4 | There are 9 + 5 = 14 shares. 1 share = 98 ÷ 14 = 7 Aki: 7 x 9 = 63 windows Gemma: 7 x 5 = 35 windows Difference = 63 - 35 = 28 (2 marks for the correct answer. Otherwise 1 mark for finding the number of windows cleaned by Aki or by Gemma.) |
| Q5 | There are 1 + 4 + 5 = 10 shares. 1 share = 200 ÷ 10 = £20 Andy: £20 x 1 = £20 Jenny: £20 x 4 = £80 Heather: £20 x 5 = £100 (2 marks for all correct amounts. Otherwise 1 mark for one correct amount.) |
| Q6 | For every 2 white chocolates there is 1 milk chocolate. There are 2 + 1 = 3 shares. 1 share = 42 ÷ 3 = 14 14 x 2 = 28 (1 mark) |
Pages 38-41 — Percentage Problems

Q1 10% of 390 = 390 \times 0.1 = 39
1% of 6800 = 6800 \div 100 = 68 (1 mark)
Q2 10% of 740 = 740 \times 0.1 = 74
5% of 740 = 740 \times 0.05 = 37 (1 mark)
10% of 2180 = 2180 \times 0.1 = 218
5% of 2180 = 2180 \times 0.05 = 109 (1 mark)
Q3 10% of 560 = 560 \times 0.1 = 56
5% of 560 = 560 \times 0.05 = 28 (1 mark)
Q4 10% of £420 = £420 \times 0.1 = £42
5% of £420 = £420 \times 0.05 = £21 (1 mark)
Q5 10% of 860 = 860 \times 0.1 = 86
5% of 860 = 860 \times 0.05 = 43 (1 mark)
Q6 10% of 300 = 300 \times 0.1 = 30
30% of 300 = 300 \times 0.3 = 90 (1 mark)
Q7 For every parcel the postman delivers, he delivers 4 letters. (1 mark)
4 \times 1 = 5
55 \div 5 = 11 (1 mark)
Parcels: 11 \times 1 = 11 (1 mark)
Letters: 11 \times 4 = 44 (1 mark)
Q8 11 \div 25 = 0.44 = 44\% (1 mark)
Q9 9 \div 3 = 3 = 100\% (1 mark)
Q10 7 \div 5 = 3 = 15\% (1 mark)
Q11 12 \div 20 = 0.6 = 60\% (1 mark)
Q12 £3500 \div £2000 = 1.75 = 175\% (1 mark)
Q13 Stuart’s percentage profit:
160 \div 800 = 0.2 = 20\% (1 mark)
Miranda’s percentage profit:
60 \div 300 = 0.2 = 20\% (1 mark)
Q14 Nutios increase:
750 \div 600 = 1.25 = 25\% (1 mark)
Branpops increase:
360 \div 300 = 1.2 = 20\% (1 mark)
Q15 Nutios are increasing by the highest percentage. (1 mark)

Pages 44-45 — Formulas and Expressions

Q1 Number of slides = 6 \times \text{number of packs} (1 mark)
Q2 Total cost = 28 \times \text{number of cupcakes} + 36 \times \text{number of doughnuts} (1 mark)
Q3 Amount of pasta = 30 \times \text{number of guests} (1 mark)
Q4 Rare:
\text{1500} \div 15 = 150 \div 2 = 7.5 = 90\text{ mins} (1 mark)
Well done:
\text{1500} \div 35 = 100 \div 35 = 135\text{ mins} (1 mark)
Extra time = 135 \div 90 = 15 \text{ mins} (1 mark)
### Q5
The total number of points is given by: 5 \times \text{number of goals} + 3 \times \text{number of penalties}.

\[5 \times 7 + 3 \times 4 = 35 + 12 = 47 \text{ points} \quad (1 \text{ mark})\]

### Q6
The rule is multiply by 2, 4, 8, 16, 32, 64 \quad (1 \text{ mark})

\[2 \times 10 = 20, \quad 20 \times 10 = 200\]

So the rule is multiply by 10. \quad (1 \text{ mark})

\[48 \div 2 = 24, \quad 24 \div 2 = 12\]

So the rule is divide by 2. \quad (1 \text{ mark})

### Q7
The difference between 6 and -2 is 8. There are 2 steps between 6 and -2 so \(8 \div 2 = 4\). The rule is subtract 4.

\[6, \quad 2, \quad -2, \quad -6, \quad -10 (1 \text{ mark for each correct term}).\]

### Section Five — Measure

### Pages 51-54 — Units and Conversions

#### Q1
1 cm, 300 mm, 800 g and 5 g should be circled. (2 marks for all correct. Otherwise 1 mark for 2 circled correctly.)

\[1 \text{ cm}, 300 \text{ mm}, 800 \text{ g and } 5 \text{ g should be circled.} \quad (2 \text{ marks for all correct.} \quad \text{ Otherwise } 1 \text{ mark for 2 circled correctly.})\]

\[1 \text{ kg} = 1000 \text{ g} \\ 8.7 \times 1000 = 8700 \text{ ml} \quad (1 \text{ mark}) \]

\[1 \text{ kg} = 1000 \text{ g} \]

\[2500 \div 1000 = 2.5 \text{ kg} \quad (1 \text{ mark}) \]

\[500 \times 10 = 5000 \text{ m} \quad (1 \text{ mark}) \]

\[1 \text{ km} = 1000 \text{ m} \quad (1 \text{ mark}) \]

\[5000 \div 1000 = 5 \text{ km} \quad (1 \text{ mark}) \]

\[1 \text{ year} = 365 \text{ days}, \quad 1 \text{ week} = 7 \text{ days} \quad (1 \text{ mark}) \]

\[1 \text{ year} = 365 \text{ days}, \quad 1 \text{ week} = 7 \text{ days} \quad (1 \text{ mark}) \]

\[= 365 + 7 + 7 = 379 \text{ days} \quad (1 \text{ mark}) \]

\[10 \text{ rubber balls would weigh } 10 \times 2 = 20 \text{ ounces} \quad = 1 \text{ lb 4 oz.} \quad (2 \text{ marks for the correct answer.} \quad \text{Otherwise 1 mark for the weight of 10 rubber balls in ounces.}) \]

\[1 \text{ km} = 1000 \text{ m} \quad (1 \text{ mark}) \]

\[0.9 \times 1000 = 900 \text{ m} \quad (1 \text{ mark}) \]

\[900 \div 150 = 6 \quad (1 \text{ mark}) \]

\[1 \text{ cm} = 10 \text{ mm} \quad \text{Let's calculate the other measurements.} \]

\[5.3 \times 10 = 53 \text{ mm} \quad (1 \text{ mark}) \]

\[4.7 \times 10 = 47 \text{ mm} \quad (1 \text{ mark}) \]

\[40 + 53 + 47 = 140 \text{ mm} \quad (1 \text{ mark}) \]
### Perimeters and Areas

**Q1**
- 6 equal sides, so perimeter = $3 \times 6 = 18 \text{ cm}$ (1 mark)
- 0 equal sides, so perimeter = $2 \times 8 = 16 \text{ m}$ (1 mark)

**Q2**
- Perimeter:
  - $6 + 2 + 6 + 2 + 6 + 2 = 32 \text{ cm}$ (1 mark)

- Area = length $\times$ width
  - Length = $2 + 6 + 2 = 10 \text{ cm}$
  - Area = $10 \times 6 = 60 \text{ cm}^2$ (1 mark)

**Q3**
- Area of $A = 8 \times 4 = 32 \text{ cm}^2$
- Area of $B = 9 \times 4 = 36 \text{ cm}^2$
- Area of $C = 13 \times 3 = 39 \text{ cm}^2$
- Area of $D = 6 \times 6 = 36 \text{ cm}^2$
- Area of $E = 18 \times 2 = 36 \text{ cm}^2$
  - So, $B$, $D$, and $E$ should be circled. (1 mark)

**Q4**
- (1 mark — rectangles may be drawn rotated 90°.)

**Q5**
- Area = length $\times$ width, so width = area $\div$ length
  - Width of rectangle $A = 18 \div 9 = 2 \text{ cm}$
  - Perimeter of rectangle $A = 9 + 2 + 9 + 2 = 22 \text{ cm}$ (1 mark)

- Length of rectangle $B = 18 \div 3 = 6 \text{ cm}$
- Perimeter of rectangle $B = 6 + 3 + 6 + 3 = 18 \text{ cm}$ (1 mark)

**Q6**
- Missing measurements:
  - $10 \div 6 = 4 \text{ m}$
  - $14 \div 9 = 5 \text{ m}$
  - Perimeter:
    - $14 + 10 + 9 + 4 + 5 + 6 = 48 \text{ m}$ (1 mark)

- Split shape into 2 rectangles and add their areas, e.g:
  - $5 \times 6 = 30 \text{ m}^2$
  - $9 \times 10 = 90 \text{ m}^2$
  - $30 + 90 = 120 \text{ m}^2$ (1 mark)

### Areas of Triangles

**Q1**
- $A = \frac{1}{2} \times \text{base} \times \text{height}$
  - $\frac{1}{2} \times 12 \times 10 = 60 \text{ mm}^2$ (1 mark)
  - $\frac{1}{2} \times 7 \times 4 = 14 \text{ m}^2$ (1 mark)
  - $\frac{1}{2} \times 3 \times 5 = 7.5 \text{ cm}^2$
  - Total = $5 + 7.5 = 12.5 \text{ cm}^2$ (1 mark)

**Q2**
- Area of left-hand triangle = $\frac{1}{2} \times \text{base} \times \text{height}$ = $\frac{1}{2} \times 2 \times 5 = 5 \text{ cm}^2$
- Area of right-hand triangle = $\frac{1}{2} \times \text{base} \times \text{height}$ = $\frac{1}{2} \times 3 \times 5 = 7.5 \text{ cm}^2$

**Q3**
- Area of square = $\text{base} \times \text{height}$ = $8 \times 8 = 64 \text{ cm}^2$
- Area of one triangle = $\frac{1}{2} \times \text{base} \times \text{height}$ = $\frac{1}{2} \times 8 \times 8 = 32 \text{ cm}^2$
- Area of four triangles = $32 \times 4 = 128 \text{ cm}^2$
  - Total area = $64 + 128 = 192 \text{ cm}^2$ (1 mark)

**Q4**
- Area of square = $3 \times 3 = 9 \text{ m}^2$
- Triangle height = $5 - 3 = 2 \text{ m}$
- Area of triangle = $\frac{1}{2} \times 3 \times 2 = 3 \text{ m}^2$
  - Total area = $9 + 3 = 12 \text{ m}^2$ (2 marks for correct answer. Otherwise 1 mark for correct area of triangle or square.)

**Q5**
- Split the square up into 4 triangles:

  - Area of one triangle = $\frac{1}{2} \times 6 \times 6 = 18 \text{ cm}^2$
  - There are 4 triangles, so area of square = $18 \times 4 = 72 \text{ cm}^2$ (2 marks for correct answer. Otherwise 1 mark for calculating the area of one triangle.)
**Answers**

**Page 59 — Areas of Parallelograms**

**Q1** Area = base x height = $3 \times 2 = 6 \text{ mm}^2$ (1 mark)
Area = $7 \times 13 = 91 \text{ m}^2$ (1 mark)

**Q2** Area of left-hand parallelogram = $6 \times 6 = 48 \text{ cm}^2$
Area of right-hand parallelogram = $8 \times 8 = 64 \text{ cm}^2$
$48 + 64 = 112 \text{ cm}^2$ (2 marks for correct answer. Otherwise 1 mark for correct area of one parallelogram.)

**Q3** Each white arrow is made up of two parallelograms of height $4 \div 2 = 2 \text{ m}$.
Area of one parallelogram = $1 \times 2 = 2 \text{ m}^2$.
So area of one arrow = $2 \times 2 = 4 \text{ m}^2$
There are two white arrows, so total white area = $2 \times 4 = 8 \text{ m}^2$.
Area of sign = $6 \times 4 = 24 \text{ m}^2$.
Area of sign that is not white = $24 - 8 = 16 \text{ m}^2$ (3 marks for correct answer; otherwise 1 mark for correct area of a parallelogram and 1 mark for correct area of an arrow.)

**Pages 60-61 — Volume**

**Q1** Volume = $l \times w \times h$
$= 8 \times 2 \times 5$
$= 80 \text{ cm}^3$ (1 mark)
Volume = $l \times w \times h$
$= 10 \times 2 \times 2$
$= 40 \text{ mm}^3$ (1 mark)

**Q2** The box with the largest volume will hold the most.
Volume of Box A = $l \times w \times h$
$= 20 \times 20 \times 20 = 8000 \text{ cm}^3$

**Q3** Volume of Box B = $l \times w \times h$
$= 25 \times 30 \times 10 = 7500 \text{ cm}^3$ (1 mark)
So Box A will hold the most. (1 mark)

**Q4** Split the shape up into 2 cuboids, then add their volumes, e.g:
Volume of cuboid 1:
$= 3 \times 4 \times 5$
$= 60 \text{ cm}^3$
Volume of cuboid 2:
$= 3 \times 3 \times 7$
$= 63 \text{ cm}^3$
Total volume = $60 + 63 = 123 \text{ cm}^3$ (2 marks for correct answer, otherwise 1 mark for correct volume)

**Q5** Volume of wooden cuboid = $l \times w \times h = 5 \times 3 \times 2 = 30 \text{ m}^3$
Volume of hole = $l \times w \times h = 5 \times 1 \times 1 = 5 \text{ m}^3$
Volume of wood = $30 - 5 = 25 \text{ m}^3$ (2 marks for correct answer. Otherwise 1 mark for correct volume)

**Section Six — Geometry**

**Pages 62-63 — Angle Rules**

**Q1** $c = a = 103^\circ$ (vertically opposite angles) (1 mark)
$b = 180^\circ - 103^\circ = 77^\circ$ (angles on a straight line) (1 mark)
$d = b = 77^\circ$ (vertically opposite angles) (1 mark)

**Q2**
A = $180^\circ - 38^\circ - 112^\circ = 30^\circ$
B = $180^\circ - 69^\circ - 88^\circ = 23^\circ$

**Q3**
A = $360^\circ - 108^\circ - 138^\circ = 114^\circ$ (1 mark)
B = $360^\circ - 33^\circ - 90^\circ - 117^\circ = 120^\circ$ (1 mark)

**Q4**
The angle between the two shorter sides of the triangle should be $90^\circ$ to within $1^\circ$. All sides should be correct to within $1\text{ mm}$.

**Q5**
All angles should be $120^\circ$ to within $1^\circ$. All sides should be correct to within $1\text{ mm}$. (2 marks. Otherwise 1 mark for four sides and three angles correct.)
**Answers**

**Pages 66-67 — Properties of Shapes**

Q1 A square has 4 right angles. A trapezium has one pair of parallel sides. An equilateral triangle has three angles of 60°.


Q3 The circumference of the circle is 20 cm. (1 mark)

**Pages 68-69 — Angles in Shapes**

Q1 $x = 180^\circ - 76^\circ - 39^\circ = 65^\circ$ (1 mark)

Q2 $y = 360^\circ - 97^\circ - 122^\circ - 74^\circ = 67^\circ$ (1 mark)

Q3 $a + b + 38^\circ = 180^\circ$

$4a = 112^\circ$

$a = 28^\circ$

$r = 15^\circ$ (1 mark)

$x = 15 - 12 = 3$ cm (1 mark)

**Pages 70-71 — 3D Shapes**

Q1 A cube has 6 faces.

Q2 Regular tetrahedron or equilateral triangle-based pyramid (1 mark) Triangular prism (1 mark)

Q3 (1 mark)

**Pages 72-73 — Coordinates**

Q1 Point A (−2, 3), Point B (3, 0), Point C (1, −4), Point D (−1, −1)

Q2 (2 marks for all coordinates correct, otherwise 1 mark for 2 or 3 coordinates correct.)

Q6 Sum of interior angles $= (n - 2) \times 180^\circ$

$= 6 \times 180^\circ = 1080^\circ$ (1 mark)

One interior angle $= 1080^\circ \div 8 = 135^\circ$ (1 mark)

Q7 Sum of interior angles $= 3 \times 180^\circ = 540^\circ$ (1 mark)

$x = 540^\circ - 146^\circ - 63^\circ - 98^\circ - 120^\circ = 113^\circ$ (1 mark)
Answers

Q3 The two given points are 7 units apart on the x-axis, so the side-length is 7.
So, point A is (5, 5) and point B is (2, -2).
(1 mark)

Q4 The rectangle has a base of 6 units and a height of 3 units, so M is (7 + 6, 9 - 3) = (13, 6). (1 mark)

Q5 The point (-3, 4) is 4 units to the left and 2 units down from the point (1, 6).
P is the same distance from (1, 6), but to the right, so P is (1 + 4, 6 - 2) = (5, 4). (1 mark)

Q6 Point T is in line horizontally with (0, 4), so it has the same y-coordinate. The length of the longer sides of the parallelogram is 6 units. It is twice as far as this horizontally from the point (0, 4), so its x-coordinate is 12. T is (12, 4). (1 mark)

Pages 74-75 — Reflection

Q1 The coordinates of the image of P are (4, -3).
(1 mark)

Q2 The coordinates of the image of Q are (2, -1).
(1 mark)

Pages 76-77 — Translation

Q1

(1 mark)

Q2

(1 mark)

Pages 78-79 — Line Graphs

Q1 Reading from the graph, Billy's mass at 2 months is 70 g. (1 mark)
**Answers**

**Q2**

The pizza section is $\frac{1}{6}$.

$\frac{1}{6} \times 20 = 20$ children, so altogether there must be $6 \times 20 = 120$ children.

(1 mark)

The sandwich section is $\frac{1}{4}$ of the pie chart, so $120 \div 4 = 30$ children chose a sandwich.

The curry section is $\frac{1}{6}$ of the pie chart, so $120 \div 6 = 20$ children chose curry.

$30 - 20 = 10$ children

(1 mark)

Multiplier = $360 + 60 = 6$

**Pages 82-83 — The Mean**

**Q1**

Total = $8 + 4 + 5 + 7 = 24$

Mean = $24 \div 4 = 6$

Total = $3 + 12 + 11 + 5 + 20 + 15 = 66$

Mean = $66 \div 6 = 11$

(1 mark)

**Q2**

Total mass = $40 + 55 + 50 + 60 + 45 = 250$ g

Mean mass = $250 \div 5 = 50$ g

(1 mark)

**Q3**

Read the daily number of photos from the graph and add to find the total: $40 + 10 + 20 + 25 + 5 = 100$

Mean = $100 \div 5 = 20$

(1 mark)

**Q4**

Total = $55 + 125 + 90 + 110 = 380$

Mean = $380 \div 4 = 95$

(1 mark)

If the mean doesn’t change, the new cake’s price must be equal to the mean, so it’s $95p$.

(1 mark)

**Q5**

8 packets with 3 slices = $8 \times 3 = 24$ slices

5 packets with 4 slices = $5 \times 4 = 20$ slices

6 packets with 5 slices = $6 \times 5 = 30$ slices

1 packet with 6 slices = $1 \times 6 = 6$ slices

Total number of slices = $24 + 20 + 30 + 6 = 80$

(1 mark)

The mean = $80 \div 20 = 4$, so the claim on the packet is not correct.

(1 mark)

**Q6**

There are 6 pupils and the mean mark is 7, so the total should be $6 \times 7 = 42$ marks.

The total marks for 5 of the pupils is $5 + 8 + 10 + 8 + 7 = 38$. So the 7th mark must be $42 - 38 = 4$.

(2 marks for correct answer. Otherwise 1 mark for finding the total number of marks.)
Test 2 — Pages 84-87

Q1

\[
\begin{array}{c|c|c|c|c}
\text{2} & \text{1} & \text{3} & \text{1} & \text{2} \\
\hline
\text{4} & \text{6} & \text{8} & \text{6} & \\
\hline
\text{7} & \text{9} & \\
\hline
\end{array}
\]

Q2

1.074, 1.407, 1.450, 1.7, 1.705 (1 mark)

Q3

The horizontal parts of the graph represent when Stephanie is not moving. Each small square represents 5 minutes horizontally. So Stephanie waits for 2 minutes horizontally.

\[2 \times (x + 5) \div (x + 5) = 15 \text{ minutes} \quad (1 \text{ mark})\]

Stephanie reaches her office 55 minutes after 7.15 am. Add on 1 hour and subtract 5 minutes:

7:30 + 1 hour = 8:15
8:15 – 5 minutes = 8:10 am
(1 mark)

Q4

Factors of 12: 1, 2, 3, 4, 6, 12
Factors of 18: 1, 2, 3, 6, 9, 18
Factors of 30: 1, 2, 3, 5, 6, 10, 15, 30
The highest number that appears in all three lists is 6 (1 mark)

Q5

Area of rectangle

\[= \text{length} \times \text{width} = 12 \times 7 = 84 \text{ cm}^2\]

Area of triangle

\[= \frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2} \times 12 \times 3 = 18 \text{ cm}^2\]

(1 mark for both areas)
Shaded area = 84 – 18 = 66 cm² (1 mark)

Q6

Sarah walked M km on Monday, 2M km on Tuesday, and 3M km on Wednesday. So M + 2M + 3M = 30.6 km, then 6M = 30.6 km and M = 5.1 km (1 mark for correct answer and 1 mark for some correct working shown.)

Q7

It takes 3°C to get to 0°C
That leaves 12 – 3 = 9°C
So –3°C + 12°C = 9°C
(1 mark)

Q8

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{9}{100})</td>
<td>0.09</td>
<td>9%</td>
</tr>
<tr>
<td>(\frac{4}{5})</td>
<td>0.8</td>
<td>80%</td>
</tr>
<tr>
<td>(\frac{3}{8})</td>
<td>0.375</td>
<td>37.5%</td>
</tr>
</tbody>
</table>

Working:

\[
5 \div 0.3 = 0.05
\]

Q9

Angles on a straight line add up to 180°.
So a = 180° – 107° = 73°
A parallelogram has two pairs of equal angles and the angles in a quadrilateral add up to 360°. So:

\[112° + 112° + b + b = 360°\]

\[224° + 2b = 360°\]

\[2b = 360° – 224° = 136°\]

So b = 136° ÷ 2 = 68°

The angle on a straight line with c is 112° as diagonally opposite angles in a parallelogram are equal.
So c = 180° – 112° = 68°
(2 marks for all three angles correct. Otherwise 1 mark for one or two angles correct.)

Q10

The number of packs produced is 600 ÷ 1.2.
Calculate 600 ÷ 12 first.

\[
\frac{600}{12} = 50
\]

12 is 10 times larger than 1.2, so multiply by 10.

50 × 10 = 500 (1 mark)

Q11

The pet shop pays £2.35 × 48
First calculate 235 × 48

\[
235 \times 48 = 11280
\]

11280 ÷ 100 = £112.80
(1 mark)

Q12

Total number of snails = 6 + 9 + 11 + 10 + 7 + 8 + 9 + 4 = 64
There are 8 numbers, so mean = 64 ÷ 8 = 8 (1 mark)

Q13

\[\frac{2}{7} \times \frac{2}{3} = \frac{2 \times 2}{7 \times 3} = \frac{4}{21} = \frac{6}{35}\]

\[\frac{2}{3} ÷ \frac{5}{7} = \frac{2 \times 3}{3 \times 5} = \frac{2}{5}\]

(1 mark for both correct)

Q14

3k + 14 = 32
3k = 32 – 14 = 18
k = 18 ÷ 3 = 6 (1 mark)