Extended answers for 11+ Maths Ages 9–10 Practice for the GL Assessment

Number: Place Value (page 6)

1	C	671,780
		When 671,780 is partitioned, 600,000 + 70,000 + 1000 + 700 + 80, it can be seen that this number has seventy thousands.

2	E	100,000s	10,000s	1000s	100s	**10s**	1s
		**	*******		***	******	******
		2	8	0	3	**7**	6

The 10s column should have 7 stars, not 6.

3	A	Hundreds	Tens	Ones	**Tenths**	Hundredths
		2	7	1 ⦁	**6**	3

Six tenths

4	D	51,000
		Adding together the partitioned numbers gives: 800,000 + 400 + 74 = 800,474 Compared with 851,474 it can be seen that **51,000** is missing.

5	C	14 / 9 / 2018
		I = 1, V = 5, X = 10, M = 1000 XIV = 10 + 4 = **14** IX = **9** MMXVIII = 2000 + 10 + 8 = **2018**

Number: Ordering and Comparing (page 7)

1	B	The smallest number goes first as it is the quickest time: 1st Sophia 27.16 **2nd Myla 27.23** 3rd Ava 27.91 4th Ffion 28.09 5th Lily 29.78
2	B	1.12 All the ones digits are the same so look at the tenths digits. The smallest tenths digit is 1 so only consider 1.132, 1.12 and 1.123. Next, look at the hundredths digit. The smallest hundredths digit is 2 so only consider 1.12 and 1.123. With no thousandths digit, **1.12** is smaller than 1.123.

3	A	$\frac{4}{6}$

Compare each fraction to a half.

Greater or equal to $\frac{1}{2}$: $\frac{4}{6}$, $\frac{1}{2}$

Less than $\frac{1}{2}$: $\frac{5}{12}$, $\frac{1}{3}$, $\frac{3}{12}$

Compare the fractions greater than or equal to $\frac{1}{2}$:

$\frac{4}{6}$						

$\frac{1}{2}$				

$\frac{4}{6}$ is greater than $\frac{1}{2}$

4	D	**CIX**

In order, the numerals are: LXV (65)   XCI (91)   **CIX (109)**   CDX (410)   DLI (551)

5	C	

$\frac{5}{8}$								

| $\frac{1}{3}$ | | | | |

| $\frac{4}{12}$ | | | | | | | | | | | |

| $\frac{3}{4}$ | | | | |

| $\frac{2}{5}$ | | | | | |

| $\frac{1}{2}$ | | |

$\frac{3}{4}$ is the only fraction given that is greater than $\frac{5}{8}$.

Number: Rounding (page 8)

1	B	**640,000**
		63**8**,436 Rounding to the nearest 10,000 means rounding the ten thousands digit (3 in bold) by looking at the thousands digit (8 underlined). 38,000 is closer to 40,000 than 30,000 and so it is rounded up.
2	B	**230,460** Rounded to the nearest thousand: 230,802 is 231,000 **230,460 is 230,000** 231,147 is 231,000 230,591 is 231,000 231,488 is 231,000
3	D	**10.15** Rounded to the nearest whole number: 9.49 is 9 10.51 is 11 9.09 is 9 **10.15 is 10** 10.60 is 11

4	C	2.57 Rounded to the nearest tenth: 8.65 is 8.7 7.46 is 7.5 **2.57 is 2.6** 5.66 is 5.7 6.06 is 6.1
5	E	4751 Rounded to the nearest thousand / hundred / ten: 4749 is 5000 / 4700 / 4750 4746 is 5000 / 4700 / 4750 4745 is 5000 / 4700 / 4750 4747 is 5000 / 4700 / 4750 **4751 is 5000 / 4800 / 4750**
6	A	9100 7624 rounded to the nearest 100 is 7600. 1465 rounded to the nearest 100 is 1500. 7600 + 1500 = **9100**
7	D	**Nearest 100: 2078; 2103; 2084** Rounded to the nearest 10: 40, 40, 50 Rounded to the nearest 100: 700, 600, 700 Rounded to the nearest 1000: 47,000, 47,000, 46,000 **Rounded to the nearest 100: 2100, 2100, 2100** Rounded to the nearest 10: 190, 200, 200

Number: Negative Numbers (page 9)

1	D	**The temperature difference between Tuesday and Wednesday is 6 degrees.** The actual temperature difference between Tuesday and Wednesday is 8 degrees (7 degrees below zero plus one degree above zero).
2	C	**35 degrees** 8 degrees below zero + 27 degrees above zero: 8 + 27 = **35 degrees**
3	B	−8 7 − 15 = −**8**
4	D	**Thursday** The thermometer shows 2 degrees colder than −25°C so it is −27°C, which was the temperature on **Thursday**.

Number: Sequences (page 10)

1	A	48 The rule for the sequence is **double** the previous number.
2	C	$7\frac{1}{3}$ The rule for the sequence is **subtract** $\frac{2}{3}$.
3	D	**10.92 and 12.12** The rule for the sequence is add 0.3. Subtract 0.3 from the first number given to get the previous one (11.22 − 0.3 = **10.92**) and add 0.3 to the last number given to get the next one (11.82 + 0.3 = **12.12**).
4	E	2182 1782 (+100) 1882 (+100) 1982 (+100) 2082 (+100) **2182**

5	B	IX, VI

XVIII	(–3)	XV	(–3)	XII	(–3)	**IX**	**(–3)**	**VI**
18		15		12		9		6

Number: Addition (page 11)

1	D	2714 + 4653 = **7367**
2	A	6827 + 1365 = **8192**
3	B	1569 + **3431** = 5000
4	E	£13.64 + £16.39 = **£30.03**
5	D	£17,283 + £34,571 = **£51,854**
6	C	3623g + 57,468g = **61,091g**

Number: Subtraction (page 12)

1	A	7614 – 2351 = **5263**
2	C	8092 – 3714 = **4378**
3	D	6000 – **3352** = 2648
4	B	5032g – 4150g = **882g**
5	D	20,672 – 14,938 = **5734**
6	E	10.06 – 9.58 = **0.48 seconds**

Number: Addition and Subtraction Multi-Step Problems (page 13)

1	C	8 – 4 + 12 (a dozen) – 10 = **6**
2	A	118 – 13 – 26 = **79**
3	C	£63 – £13 + £5 – £59 = –**£4**
4	E	600,000 + 50,000 + 4000 – 300 – 20 – 1 = **653,679**

Number: Multiplication (page 14)

1	B	1234 × 3 = **3702**
2	C	175 × 41 = **7175**
3	D	7 × **336** = 2352
4	E	£149 × 32 = **£4768**
5	C	138g × 12 (a dozen) = **1656g**
6	A	220 × 24 = **5280**

Number: Division (page 15)

1	A	3456 ÷ 8 = **432**
2	C	7776 ÷ 6 = **1296**
3	E	8008 ÷ 9 = 889 remainder **7**
4	E	336 ÷ 7 = **48**
5	D	£12.16 ÷ 8 = **£1.52**
6	B	147cm ÷ 6 = **24.5cm** or **245mm**

Number: Multiply and Divide by 10, 100, 1000 (page 16)

1	A	$0.3 \times 100 = \textbf{30}$ The digits move two places to the left when multiplying by 100.
2	E	$92 \div \textbf{1000} = 0.092$ The digits move three places to the right when dividing by 1000.
3	C	$470 \div 100 = \textbf{0.047} \times \textbf{100}$ $4.7 = 4.7$ The digits move two places to the right when dividing by 100 and two places to the left when multiplying by 100.
4	D	**100** There are ten 10p coins in £1, so in £10 there are $10 \times 10 = \textbf{100}$ 10p coins in £10.
5	E	$£370.40 \div 10 = \textbf{£37.04}$ The digits move one place to the right when dividing by 10.
6	B	**1020** In reverse: $102 \div 10 = 10.2$ $10.2 \times 100 = \textbf{1020}$ The digits move one place to the right when dividing by 10 and then two places to the left when multiplying by 100.

Number: Multiplication and Division Problems (page 17)

1	D	$4 \times 4 \times 8 = \textbf{128}$ $11 \times 11 = 121$ $5 \times 5 \times 5 = 125$ $7 \times 17 = 119$ $4 \times 5 \times 6 = 120$
2	A	$£10.99 \div 2.5$ is the same as $£21.98 \div 5 = \textbf{£4.40}$
3	C	**336** 12 (a dozen cows) × 2 (bales of hay) × 14 (days in a fortnight) = **336 bales of hay**
4	D	**19** 150 (chair covers) ÷ 8 (number per pack) = 18 remainder 6 The answer must be rounded up to **19 packs** otherwise there won't be enough chair covers.
5	C	**17 weeks** £80 (cost) – £31 (already saved) = £49 (needed) £49 (needed) ÷ £3 (pocket money per week) = 16 remainder 1 The answer must be rounded up to **17 weeks** otherwise Evie won't have saved enough money.
6	B	**$31.25** £25 ÷ 4 = £6.25 (to find 0.25) £25 + £6.25 = **$31.25** (to find 1.25)
7	B	**37** £129.50 ÷ £3.50 is the same as £259 ÷ £7 £259 ÷ £7 = **37**

Number: Multiples and Factors (page 18)

1	A	144
		Multiples of 4 between 140 and 165: 140, **144**, 148, 152, 156, 160, 164
		Multiples of 6 between 140 and 165: **144**, 150, 156, 162
		Multiples of 8 between 140 and 165: **144**, 152, 160
		The only number between 140 and 165 that is a multiple of 4, 6 and 8 is **144**.
2	C	60
		40 and 80 are not multiples of 3.
		120 is greater than 100.
		66 is not a multiple of 4 or 5.
		60 is a multiple of 2, 3, 4 and 5.
3	D	**54** is the only one of the five numbers that isn't a multiple of 7.
4	B	6
		$56 \div 28 = 2$
		$\mathbf{56 \div 6 = 9\frac{1}{3}}$
		$56 \div 2 = 28$
		$56 \div 8 = 7$
		$56 \div 14 = 4$
5	D	**4 and 18**
		$2 \times 31 = 62$
		$7 \times 8 = 56$
		$3 \times 28 = 84$
		$\mathbf{4 \times 18 = 72}$
		$5 \times 13 = 65$
6	C	**36 and 48**
		24 and 32: 3, 6 and 12 are not factors of 32
		6 and 12: 12 is not a factor of 6
		36 and 48: 1, 2, 3, 4, 6 and 12 are all factors of 36 and 48
		24 and 72: 24 is also a common factor of 24 and 72
		30 and 60: 4 and 12 are not factors of 30
7	A	**2, 2, 2, 7**

Number: Squares, Cubes and Primes (page 19)

1	D	32
		$81 = 9 \times 9$
		$25 = 5 \times 5$
		$121 = 11 \times 11$
		32 – not a square number
		$9 = 3 \times 3$

2	E	$6^2, 4^2$
		$7^2 + 1^2 = 49 + 1 = 50$
		$5^2 + 5^2 = 25 + 25 = 50$
		$6^2 + 5^2 = 36 + 25 = 61$
		$7^2 + 2^2 = 49 + 4 = 53$
		$\mathbf{6^2 + 4^2 = 36 + 16 = 52}$
3	D	$\mathbf{62 = 4^3}$
		$121 < 5^3$ $121 < 125$
		$6^3 > 200$ $216 > 200$
		$3^3 = 27$ $27 = 27$
		$\mathbf{62 = 4^3}$ $62 \neq 64$
		$2^3 < 9$ $8 < 9$
4	B	$\mathbf{121} - 57 = 64$
5	C	$\mathbf{51} = 3 \times 17$
6	D	**17, 5, 11, 2**
		13, 2, 7, 9 $9 = 3 \times 3$
		3, 19, 15, 2 $15 = 3 \times 5$
		5, 17, 3, 15 $15 = 3 \times 5$
		17, 5, 11, 2 All prime
		11, 4, 7, 19 $4 = 2 \times 2$

Number: Fractions and Decimals (page 20)

1	C	**0.7**
		$7 \div 10 = 0.7$
		$\frac{7}{10} = \mathbf{0.7}$
2	B	$\frac{4}{100}$
		$4 \div 100 = 0.04$
		$0.04 = \frac{4}{100}$
3	D	$\frac{1}{2} > \mathbf{0.45}$
		$\frac{8}{10} = 0.8$, not 0.82
		$0.2 < \frac{1}{3}$, not >
		$\frac{3}{5} = 0.6$, not <
		$\frac{1}{2} > \mathbf{0.45}$
		$0.1 < \frac{1}{4}$, not >
4	D	$\frac{45}{100}$ **and 0.45**
		There are ten equal-size rectangles. Four and a half of them are shaded. Four and a half out of 10 is equal to $\frac{45}{100}$ **and 0.45**.
5	C	$\frac{73}{100}$
		$\frac{7}{10} = 0.7$
		$\frac{65}{100} = 0.65$ 0.76 $\frac{73}{100} = 0.73$ 0.8 0.66
		$\frac{73}{100}$ (0.73) is only 0.03 away from 0.7 and is closest.
6	A	**£31.50**
		£35 ÷ 10 = £3.50 (10% of the full price)
		£35 − £3.50 = **£31.50** (full price less 10%)

7	D	$\frac{8}{10}$ 1kg is equal to 10 portions of 100g. 2 of the 10 portions are used, which can be written as $\frac{2}{10}$. This leaves 8 of the 10 portions, which can be written as $\frac{8}{10}$.
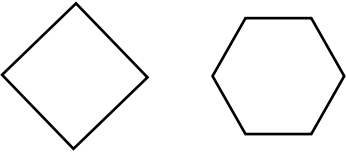
Number: Percentages (page 21)

1	B	$170 \div 2 = \textbf{85}$
2	C	$90 \div 10 = 9 \qquad 9 \times 7 = \textbf{63}$
3	D	£5 ÷ 4 = £1.25 £5 − £1.25 = **£3.75**
4	C	£35 × 2 = **£70**
5	E	**40% of 90** 20% of 160 = 32 75% of 44 = 33 25% of 120 = 30 70% of 50 = 35 **40% of 90** = 36
6	E	$190 \div 10 = 19 \qquad 19 \times 7 = \textbf{133}$
7	D	336km ÷ 4 = **84km**
8	A	**£40** £16 = 40%, so £4 is 10% £4 × 10 = 100%, so the trainers cost £40

Number: Word Problems (page 22)

1	E	(1 × 8) + (2 × 3) + (3 × 4) + (26 × 1) = 8 + 6 + 12 + 26 = **52**
2	D	395m × 7 = 2765m 3000m − 2765m = **235m**
3	D	6000g ÷ 8 = 750g 750g × 3 = 2250g 6000g − 2250g = 3750g = **3.75kg**
4	D	(24 × £1.50) + (12 × £2) + (8 × £2.50) + (6 × £3) = £36 + £24 + £20 + £18 = **£98**

Geometry: Properties of 2D Shapes (page 23)

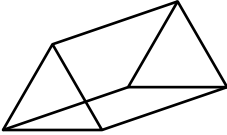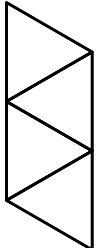| 1	B	**Two** of the polygons are regular: a square and a hexagon. Each shape has sides all the same length and angles all the same size.
2	D	**It has four vertices, one pair of parallel lines and one pair of equal sides. It has two acute angles and two obtuse angles.**
3	D	9cm − 2cm = **7cm**

Geometry: Angles (page 24)

1	E	Angle 3 is a **reflex** angle. It is greater than 180° but less than 360°.
2	B	An obtuse angle is greater than 90° but less than 180°.

| 3	A	**54°** Straight line = 180° 180° − 106° − 20° = **54°**
4	C	**125°** This angle is an obtuse angle, so it is between 90° and 180°. It is less than one and a half right angles, so it is less than 135°. It is a cube number so it must be **125°** as it is the only cube number between 90 and 135.

Geometry: 3D Shapes (page 25)

1	E	4 A square-based pyramid has **four triangles** joined to a square.
2	E	Net A is incomplete – one face would be open. Net B has the small square incorrectly placed as it would prevent the top and right 'arms' connecting. Net C would create two overlapping faces and an open face opposite. Net D has incompatible face dimensions. The two smaller faces are twice the size they should be in order to successfully fold the net into a cuboid. Net **E** is a net of a complete cuboid.
3	C	Nine lines are shown indicating the **9 edges**. The **6 vertices** can be seen one on each corner of the two triangles. There are two triangular faces and three rectangular faces, making **5 faces** altogether.
4	D	A tetrahedron is made from triangles only.

Geometry: Coordinates (page 26)

1	**C**	Point C has been added to the diagram at **(6, 4)** and it makes a right angle.
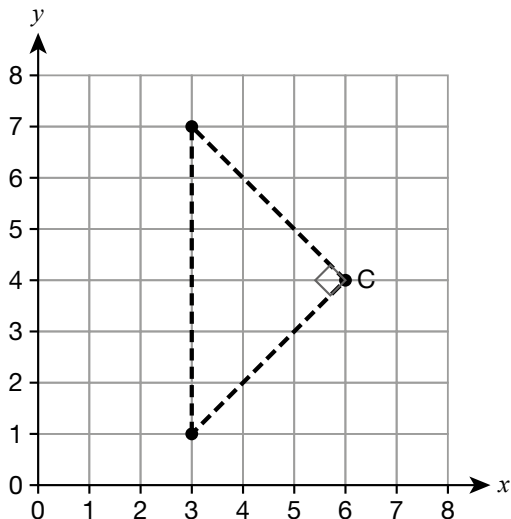
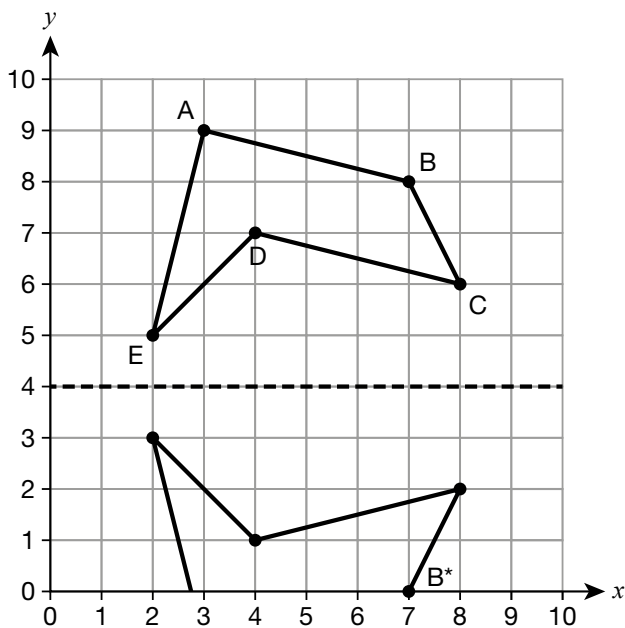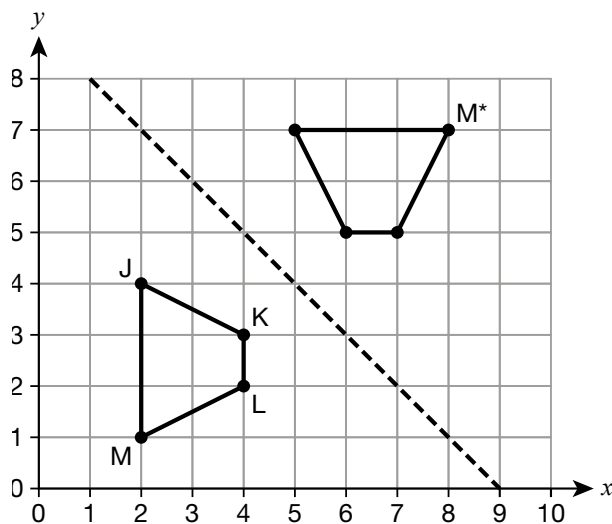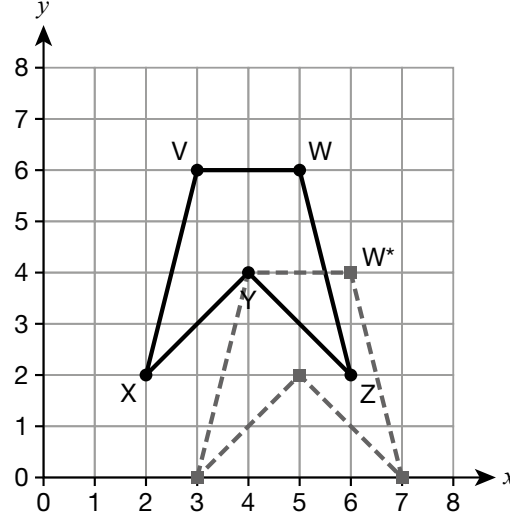| **2**	**E**	The diagram shows points A to E. Adding points A, B, C or D would allow the lines shown through three points. It isn't possible to draw a straight line through three points when adding point **E**.
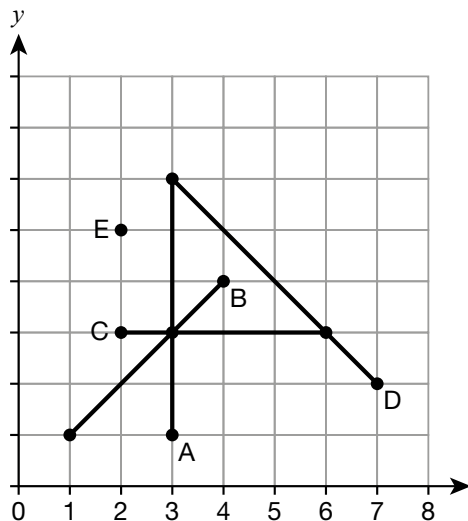
Geometry: Reflection (page 27)

1	B	The diagram shows the reflected shape. The reflection of **B** is B* which has coordinates (7, 0). [The reflection of A is below the *x*-axis]

2	B	The diagram shows the reflected shape. The reflection of M is **M*** which has coordinates **(8, 7)**.

Geometry: Translation (page 28)

1	D	The dashed line shows the translated shape. W is translated to W* which has coordinates **(6, 4)**.

2	C	**12** (3, 5) is translated to (7, 2) so the first coordinate increases by 4 and the second coordinate decreases by 3. All coordinates of the triangle change in the same way. So (4, 8) goes to (8, 5) and (2, 4) goes to (6, 1). The sum of the missing numbers is 5 + 6 + 1 = **12**.

Measurement: Converting Units (page 29)

1	D	50 × 12cm = 600cm = **6m**
2	E	**600mm** Converting to cm, 0.2m = 20cm, 0.7m = 70cm, 4m = 400cm, 50mm = 5cm, 600mm = 60cm. In order: 5cm, 20cm, **60cm**, 70cm, 400cm. So **600mm**, or 60cm, is in the middle.
3	B	3.2kg = 3200g. So each box is 3200g ÷ 5 = **640g**.
4	B	One foot is roughly 30cm, so five feet is roughly 5 × 30cm = **150cm**.
5	C	**20 miles** John runs 7 × 5km = 35km in the week. 1 mile is roughly 1.6km, so 20 miles is roughly 20 miles × 1.6 = 32 km. 15 miles would be 15 miles × 1.6 = 24km and 40 miles would be 40 miles × 1.6 = 64km. So, **20 miles** is closest.

Measurement: Perimeter (page 30)

1	C	**12m** The top and bottom total 20m + 20m = 40m. So, the right and left sides must total 64m – 40m = 24m. The right and left sides are the same length so 24m ÷ 2 = **12m**.
2	A	**Shapes 2 and 5** **Shape 2** has a perimeter of 4cm + 4cm + 4cm + 4cm = 16cm. **Shape 5** has a perimeter of 3cm + 5cm + 3cm + 5cm = 16cm also.
3	A	**5cm** The top and bottom total 7cm + 4cm = 11cm. So, the right and left sides must total 21cm – 11cm = 10cm. The right and left sides are the same length so 10cm ÷ 2 = **5cm**.

| 4 | E | **33cm**
The perimeter of the star is the same as the length of 12 sides of a triangle. So, the side length of a triangle is 132cm ÷ 12 = 11cm. Therefore, the perimeter of a triangle is 3 × 11cm = **33cm**. |

Measurement: Area (page 31)

1	D	approx. 11 squares × 9m² = 99m² so **90m²** is the closest option
2	A	**128cm²** Think of the offcut as a rectangle at the bottom of 14cm by 7cm and a smaller rectangle at the top of 6cm by 5cm (because 12cm – 7cm = 5cm). So, the area is (14cm × 7cm) + (6cm × 5cm) = 98cm² + 30cm² = **128cm²**.
3	B	**10m²** The areas are 29m × 20m = 580m² and 30m × 19m = 570m². So, the difference is 580m² – 570m² = **10m²**.

Measurement: Volume and Capacity (page 32)

1	B	**700cm³** The markings on the container represent each 100ml. The liquid line is at the 7th line from the bottom of the container so it is 700ml. 1ml = 1cm³ so 700ml = **700cm³**.
2	D	**30m³** The bottom layer has 4 × 4 = 16 blocks. The next layer has 3 × 3 = 9 blocks. The next layer has 2 × 2 = 4 blocks. And the top layer has 1 block. So, there are 16 + 9 + 4 + 1 = 30 blocks. Each has a volume of 1m³ so the volume is 30 × 1m³ = **30m³**.
3	D	**90** Each layer can fit 3 rows of 6 cubes, so 18 cubes. And there are 5 layers, so 5 × 18 = **90 cubes**.
4	D	**40** A layer of four books laid flat in two rows and two columns will fill 40cm by 30cm by 3cm. Ten of those layers will fill the height of 30cm. So, 10 × 4 = **40 books** in total.

Measurement: Money (page 33)

1	D	**55p** He spends 4 × £1.20 = £4.80 on cars and 3 × £1.55 = £4.65 on lorries. So, he spends £4.80 + £4.65 = £9.45. His change is £10.00 – £9.45 = £0.55 = **55p**.
2	A	**£36.60** The discount is £54.90 ÷ 3 = £18.30. The sale price is £54.90 – £18.30 = **£36.60**.
3	D	**tea and sandwich** cost £1.35 + £2.80 = £4.15, so his change is £5.00 – £4.15 = £0.85 = 85p.
4	D	255,000 ÷ 150 = **1700** so £1 = 1700 KʀW
5	C	**£12.50** It is cheaper to buy six doughnuts for £2.50 than six individual doughnuts (6 × 50p = £3.00). It is cheaper to buy a dozen (12) doughnuts for £4.50 than two packs of six (2 × £2.50 = £5.00). So, Michael should buy two × a dozen doughnuts, one six-pack and two singles. That costs (2 × £4.50) + £2.50 + (2 × 50p) = £9.00 + £2.50 + £1.00 = **£12.50**.

6	B	£65
		Pete earns 120 × £10 = £1200 from tickets. He spends 120 × £5.50 = £660 on food and so he spends a total of £200 + £275 + £660 = £1135. So he has £1200 – £1135 = **£65** left.

Measurement: Time (page 34)

1	A	twenty past nine
		After 20 minutes it is eight o'clock. After a further 60 minutes (80 in total) it is nine o'clock. After the remaining 20 minutes (100 in total) it is **twenty past nine**.
2	D	13:20
		11:25 plus 40 minutes' preparation is 12:05. The first hour of cooking takes the time to 13:05. And the final quarter of an hour (15 minutes) takes the time to **13:20**.
3	B	108 minutes
		11:32 to 12:00 is 28 minutes; 12:00 to 13:00 is 60 minutes; and 13:00 to 13:20 (1:20pm) is 20 minutes. The total is 28 + 60 + 20 = **108 minutes**.
4	B	2 hours and 25 minutes
		19:40 to 20:00 is 20 minutes; 20:00 to 22:00 is 2 hours; 22:00 to 22:05 is 5 minutes. The total is **2 hours and 25 minutes**.
5	D	5 hours and 15 minutes
		A double lesson is 90 minutes. So, five single lessons and a double lesson is 5 × 45 + 90 = 315 minutes. Five lots of 5 hours is 5 × 60 = 300 minutes so the answer is **5 hours and 15 minutes**.
6	B	11 minutes
		2 hours and 22 minutes is 2 × 60 + 22 = 142 minutes. At 11 minutes per mile Jack would take about 13 × 11 = 143 minutes. His speed is close to **11 minutes** per mile.

Measurement: Measure Problems (page 35)

1	B	100
		One inch is roughly 25mm. The length of A4 paper is 297mm, which is roughly 300mm. 300mm ÷ 25mm = 12in. The width is 210mm, which is roughly 200mm ÷ 25mm = 8in. The area is roughly 12in × 8in = 96 square inches, so about **100 square inches**.
2	C	120ml
		1ml of concentrate makes 1ml + 24ml = 25ml of cleaner. 3 litres is 3000ml, which contains 3000ml ÷ 25ml = 120 lots of 25ml. So, Neil needs 120 lots of 1ml of concentrate, which is **120ml**.
3	D	1:00pm
		The area is 150m × 120m = 18,000m². That takes 18,000m² ÷ 4000m² = 4.5 hours. Adding 4 hours 30 minutes to 8:30am gives **1:00pm**.
4	B	800mm
		Each side of the regular pentagon is 250mm ÷ 5 = 50mm. The two longer sides of the triangle total 210mm – 50mm = 160mm. The star uses five copies of these two sides so its perimeter is 160mm × 5 = **800mm**.

Statistics: Data Tables (page 36)

1	C	**Chloe** had a difference of 7 between English (18) and Verbal Reasoning (11). The other children had differences of 1 for Amy, 6 for Bao, 4 for Dilip and 4 for Elena.

2	D	5
		The largest continent is Asia with an area of 44.6 million km^2 and the smallest is Australia with an area of 9 million km^2. 44.6 is close to 45, and 45 ÷ 9 = **5**.
3	D	£15.00
		Wednesday morning is off-peak. Individual tickets would cost 3 × £7.50 = £22.50 for the children and 2 × £12.50 = £25.00 for the adults so £22.50 + £25.00 = £47.50 in total. The family ticket costs £32.50. So, the saving is £47.50 – £32.50 = **£15.00**.

Statistics: Timetables (page 37)

1	C	3:36
		Find 3:12 against Koper. Then read down the column until Strunjan, which gives the time **3:36**.
2	A	25
		2:05pm is the same as 14:05. The next train from West Wimplesham is the 14:30. The time from 14:05 to 14:30 is **25** minutes.
3	E	16:51
		Trams 1 and 3 take 27 minutes between the Hospital and the Stadium and 19 minutes between the Stadium and the Town Hall. Tram 2 takes 17 minutes between the Hospital and the Stadium and 29 minutes between the Stadium and the Town Hall. The **16:51** time for the Stadium for Tram 2 should be 17:01.

Statistics: Line Graphs (page 38)

1	C	£850
		There are five horizontal gridlines per £500, so each gridline is £100. 70 T-shirts is halfway between 60 and 80 so follow that vertical line up to the graph line and read across. It is halfway between the horizontal lines for £800 and £900 so the cost is **£850**.
2	D	3750
		There are four vertical gridlines per 1000 visits, so each gridline is 250 visits. The highest value is for day 12 and is three gridlines above 3000, so 3000 + (3 × 250) = **3750**.

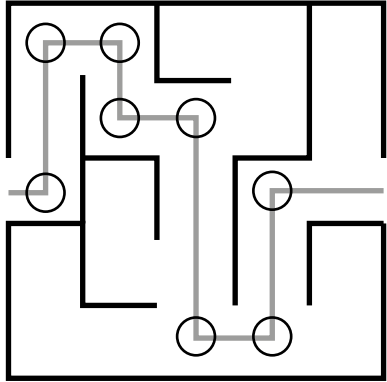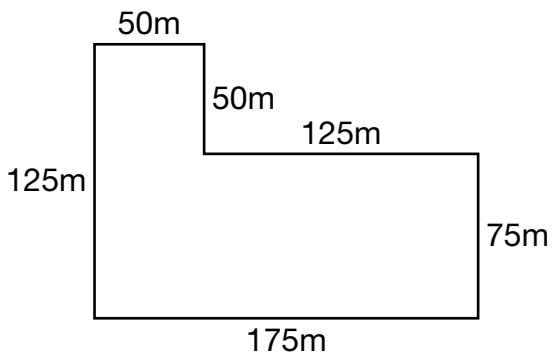## Practice Paper 1 (pages 39–45)

1	D	**4.72** matches all of the clues. Of the other answers: 5.12 is bigger than 4.72; 4.55 has an odd hundredths digit; 4.18 rounded to the nearest whole number is 4; and 4.125 has three decimal places.
2	D	**37°** A square has angles of 90° and angles on a straight line add up to 180°. So, 90° + y + 53° = 180°. y must be 37°.
3	A	**£1.30** They will save the most if they buy the most expensive items: falafel, apple juice and grapes. Those would cost £2.85 + £1.20 + £0.75 = £4.80. The saving is then £4.80 – £3.50 = £1.30.
4	C	**one third** Work in twelfths because there are quarters and thirds (4 × 3 = 12). Frank has six twelfths, Georgie has eight twelfths and Harry and Ian each have nine twelfths. Together they eat 6 + 8 + 9 + 9 = 32 twelfths. Three pizzas have 36 twelfths. So, the remainder is four twelfths, which equals one third.
5	C	**6 May** Adding seven days each time, the matches are on: 25 March, 1 April (because March has 31 days), 8 April, 15 April, 22 April, 29 April and 6 May (because April has 30 days).
6	C	**9kg** The horizontal gridlines have gaps of 2kg. The hippo weighs 19kg at the start of month 3 and 28kg at the start of month 5. So, it gains 28kg – 19kg = 9kg.

7	E	**120cm** 75% is the same as three quarters. One quarter of 160cm is 40cm so three quarters is 120cm.
8	A	**75 + 136** = 211 and 136 – 75 = 61 so 75 and 136 match the description.
9	B	**2.25 litres** One batch needs 225ml so 10 batches need 2250ml. There are 1000ml in one litre so this is 2.25 litres.
10	D	**18cm** The length is 6cm (it goes from 3 to 9) and the height is 3cm (it goes from 2 to 5). So, the perimeter is 6 + 3 + 6 + 3 = 18cm.
11	E	£774 ÷ 9 = **£86**
12	E	**36** is a multiple of 6 and a square (6 × 6 = 36) and a multiple of 9 (4 × 9 = 36).
13	C	**45** is not a multiple of 7, as 45 divided by 7 is 6 remainder 3.
14	B	**Three** Using 2 as an example: 2 + 4 = 6; 6 × 4 = 24; 24 – 4 = 20; 20 ÷ 4 = 5; and 5 – 2 = 3. Using 5 instead: 5 + 4 = 9; 9 × 4 = 36; 36 – 4 = 32; 32 ÷ 4 = 8; and 8 – 5 = 3. The answer is always 3 for any starting number.
15	D	**D** is not a regular polygon because its angles are not all equal.
16	A	**–7°** Think of dropping by 13 degrees as dropping by 6° to 0° and then dropping by another 7° to –7°.
17	B	**–6** The sequence is 15, 8, 1, –6, –13, … so –6 is the fourth value.
18	C	**2.25l** She needs 30 × 50ml = 1500ml of blue paint and 30 × 25ml = 750ml of red paint. So, 1500ml + 750ml = 2250ml in total. There are 1000ml in one litre so this is 2.25l.
19	B	**6m** Think of the pool as being made of two rectangles – one on the right, which is 5m × 4m, and one on the left which is a × 4m. We know that the bottom edge of the rectangle on the left is 4m because it is 9m – 5m. The rectangle on the right has an area of 20m² so the one on the left must have an area of 24m² (= 44m² – 20m²). So, a × 4m = 24m² and a = 6m. 9m 4m a 5m 4m
20	A	**£2.64** The price increases 2022 – 2017 = 5 times, so the total increase is 5 × 17p = 85p. So, the new price is £1.79 + £0.85 = £2.64.
21	D	**21 pints** One litre is about 1.75 pints. So, two litres would be about 3.5 pints and a 4-litre bottle would be about 7 pints. So, three 4-litre bottles would be about 3 × 7 = **21 pints**.

22	A	**Bagpuss** The years are: Bagpuss 1974, SuperTed 1983, Bob the Builder 2001, Inspector Gadget 1996, and Postman Pat 1981. So, **Bagpuss** is the oldest.
23	E	**3 hours 20 minutes** The factory can make 5 balls per minute (five machines each making one ball per minute). So, 1000 balls takes 1000 ÷ 5 = 200 minutes. And 200 minutes is **3 hours 20 minutes** (3 × 60 + 20 = 200).
24	B	**26** If she is 26 now then her age was a square number last year (5 × 5 = 25) and will be a cube number next year (3 × 3 × 3 = 27).
25	D	7 × £15 = **£105**

Practice Paper 2 (pages 46–52)
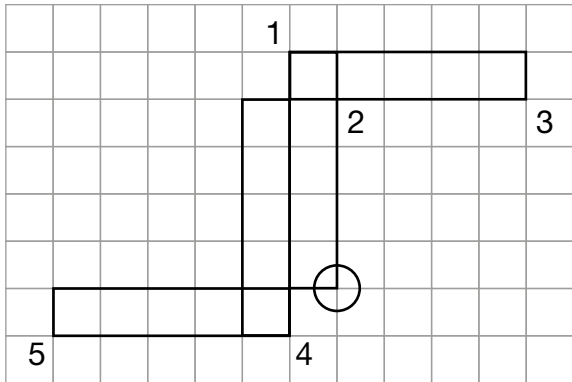
1	A	A is **67,475**; B is 67,102; C is 62,055; D is 66,213; and E is 65,579. So, A is greatest.
2	D	If L moves **one right and one up** to (6, 7) then LN has would have length 3, MN would still have length 4 and LM would be bigger than either of them. So, no two sides would have the same length.
3	B	**–18°C** Think of 23 degrees colder as 5 degrees colder (going from 5°C to 0°C) then another 18 degrees colder (going from 0°C to –18°C).
4	C	**5, 5, 7 5**43 + 3**5**4 = 89**7**
5	E	4.5 – 1.73 = **2.77 litres**
6	B	**Infants did one more** Infants did 138 + 149 + 141 = 428. Juniors did 76 + 105 + 135 + 111 = 427. So, Infants did one more lap.
7	C	367 × 24 = **8808**
8	B	**130** There were 20 non-fiction (200 × 10%) and 50 textbooks (200 × 25%). So, there were 200 – 20 – 50 = 130 fiction books.
9	B	**35 minutes** So far he has run 28 + 38.5 + 33.5 + 45 = 145 minutes. Three hours is 180 minutes so he needs to run 180 – 145 = 35 minutes more.
10	C	If Maude made **16** then Elsie made 22 (6 more than Maude) and Florence made 12 (10 fewer than Elsie), giving a total of 50.
11	A	The **eight** right-angles are circled in the diagram.
12	E	**–£11** Think of spending £27 as spending £16 then spending £11. The £16 takes his balance to £0 then spending £11 takes it to –£11.
13	D	**8** 8 is a common factor of 56 and 24.
14	B	**0.103 × 100** = 10.3, not 103.
15	E	Multiples starting from 90 are 90, 99, 108, 117, 126, 135, 144 and 153. So, **126**, **135** and **144** are the multiples between 120 and 150.

16	B	**5** The diagram below shows the missing lengths where 50m = 125m – 75m and 125m = 175m – 50m. The perimeter is 50m + 50m + 125m + 75m + 175m + 125m = 600m per lap. Five laps would be 5 × 600m = 3000m = 3km.
17	C	**Japan** The increases between 1970 and 2000 are: Australia 79.6 – 70.7 = 8.9; France 79.1 – 72.1 = 7.0; Japan 81.2 – 72.0 = 9.2; UK 77.9 – 71.9 = 6.0; and USA 76.8 – 70.7 = 6.1. So, Japan has the largest increase.
18	D	**Thursday** As there are seven days in a week, it will be Wednesday when she is 0, 7, 14, 21, 28, 35, 42 and 49 days old. So, it will be Thursday when she is 50 days old.
19	C	**3** 2302, 1951 (MCMLI) and 2487 all round to 2000 as they are between 1500 and 2499. 1420 and 1497 both round to 1000.
20	A	**£9** 10% of £30 is £3 so 60% is £18. $\frac{1}{5}$ of £45 is £9 so $\frac{3}{5}$ of £45 is £27. So, the difference is £27 – £18 = **£9**.
21	B	The area is 80m × 45m = 3600m^2. So, he needs 3600 × 5 = **18,000**.
22	E	**3^2 and 6^2** 3^2 = 3 × 3 = 9, 6^2 = 6 × 6 = 36, and 9 × 36 = 324.
23	D	**D** If one unit is the distance between two neighbouring dots then A, B, C and E all have perimeters of 10, but **D** has a perimeter of 12.
24	A	9801 ÷ 9 = **1089**
25	A	Convert the fractions to decimals, $3\frac{2}{3}$ = 3.666…, $3\frac{3}{4}$ = 3.75 and $3\frac{2}{5}$ = 3.4. So, in order the numbers are 3.4, 3.5, 3.666…, 3.75 and 3.8. **$3\frac{2}{3}$** is in the middle.

Practice Paper 3 (pages 53–59)

1	C	**8054g > 8.5kg < 8.7kg** is wrong because 8.5kg = 8500g so 8054g < 8.5kg.
2	C	**9m** The highest bird is at +3m. The jellyfish is at –6m. So, there is 9m between them – 3m from the bird to the top of the water plus 6m down to the jellyfish.
3	E	**32,196** If he counts back in steps of 10,000 then the last four digits don't change (as long as he stays above zero). So, a number in his sequence must end in 2,196.
4	A	**10,000** There are 60 minutes in one hour and 24 hours in one day so there are 60 × 24 = 1440 minutes in a day. There are 7 days in a week so there are 1440 × 7 = 10,080 minutes in one week.
5	D	**74cm (l), 9cm (w), 9cm (d)** The length, width and depth of parcel D have a total of 74cm + 9cm + 9cm = 92cm, which is more than 90cm.
6	B	**3,682,913** The first 1000 prime numbers consist of one even number (2) and 999 odd numbers (all the others). The 999 odd numbers have an odd total (as any odd number of odd numbers has an odd total) so the first 1000 primes also have an odd total.
7	E	**Angle E** is more than 180°, so it is reflex, not obtuse.

8	A	**20mm × 50mm × 110mm** Working in cm and cm³, the volumes are A: 2 × 5 × 11 = 110, B: 12 × 12 × 1 = 144; C: 5 × 5 × 5 = 125; D: 4 × 5 × 6 = 120; E: 15 × 4 × 2 = 120. So, A is smallest.
9	A	**£182.25** At full price they would cost £37.50 + £165 = £202.50. A 10% discount would be £20.25. So, the sale price would be £202.50 − £20.25 = £182.25
10	B	The total length is 57 × 10cm = 570cm. There are 100cm in 1m so this is **5.7m**.
11	D	**56** is 2 more than 54 and 6 × 9 = 54.
12	E	He thought of **4**, as 4 + 3 = 7, 7 × 7 = 49, and 49 × 2 = 98.
13	B	**25%** 75% (60% + 15%) is cotton or elastane. So, the remainder is 100% − 75% = 25%.
14	C	He earns £45 interest (10% × £450). So, he now has £450 + £45 = **£495**.
15	D	**Rita's** The costs would be: Sally's 200 packs costing £100; Paula's 100 packs costing £99; Ollie's 50 packs costing £92.50; Rita's 40 packs costing £91.60; and Micky's 20 packs costing £99. So, Rita's would be cheapest.
16	D	**£104.50** On Wednesday they need 2 hours at £10.00 and 2 hours at £12.50, costing £45 (2 × £10.00 + 2 × £12.50). On Saturday they need 3 hours at £14.00 and 1 hour at £17.50 costing £59.50 (3 × £14.00 + 1 × £17.50). The total is £45 + £59.50 = £104.50.
17	B	**B** matches all statements. A, C and E don't have an obtuse angle, and D has 4 vertices.
18	A	**6 thousands** The question mark is in the thousands position and the number of thousands must be between 0 and 9 as it is only a single digit.
19	C	**C** The diagram shows the reflected shape, where A* is the reflection of A, B* is the reflection of B and so on. C* is closest to (0, 0).
20	C	**39°** It rises 18° to reach 0° and another 21° to reach 21°. So, the total rise is 18° + 21° = 39°.
21	D	**8cm** The area of the rectangle is 16cm x 4cm = 64cm². The area of the square must also be 64cm² so the sides must be 8cm (8cm x 8cm = 64cm²).
22	E	£2160 ÷ 100 = **21.6m²** 1m² = £100, so £2160 ÷ 100 = 21.6m²
23	C	**7:56pm** 7:30pm is the same as 19:30. The metro leaves Byker every 15 minutes so the next train Geoff can catch is the 19:33. The journey takes 23 minutes so he will arrive at 19:56, the same as 7:56pm.

24	B	When the net is folded, **3** and **4** both meet at the circled vertex.

25	B	**one day and 14 hours** A is 24 + 16 = 40 hours; B is 24 + 14 = 38 hours; C is 24 × 7 ÷ 4 = 42 hours; D is 39 hours; and E is 2400 ÷ 60 = 40 hours. So, B is shortest.