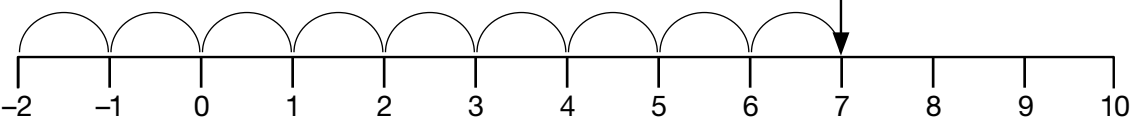
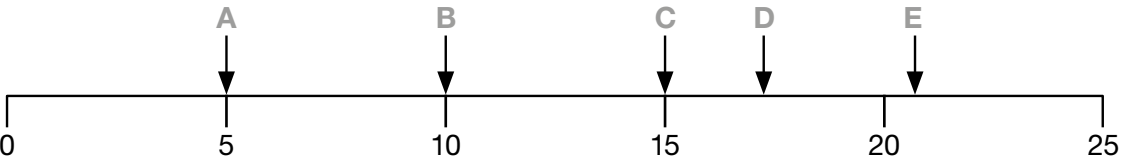


Extended Answers for 11+ Maths Practice and Test for the GL Assessment Ages 10–11

Number: Number Lines (page 6)

1	D	From -2 to 10 is 12 . $\frac{3}{4}$ of 12 is 9 so count on 9 from -2 . 
2	C	Divide the number line into 5 s to show the location of 15 . 
3	B	The whole number line from 3.6 to 3.8 has a length 0.2 . The distance from 3.6 to 3.62 is 0.02 . So 3.62 is $0.02 \div 0.2 = \frac{1}{10}$ of the way along the number line.
4	D	15% of 360 is 54 . That is just over halfway between 0 and 100 , as is D .

Number: Order and Compare (page 7)

1	B	B is largest. B is greater than $742,600$, but the others are less than that.
2	D	Expressed as percentages, these are $A: 37.5\%$, $B: 16.7\%$, $C: 33.3\%$, $D: 15\%$, $E: 20\%$, so D is smallest.
3	C	7.104 and 7.014 would need to swap places. 7.104 is greater than 7.04 , and 7.014 is less than 7.04 , so the correct order is: $7.014, 7.04, 7.104, 7.11, 7.14$
4	A	The largest possible number is 9542 with digits in descending order. The smallest possible number is 2459 with digits in ascending order. $9542 - 2459 = 7083$
5	C	The missing number is between $\frac{6}{10}$ (0.6) and $\frac{15}{20}$ (0.75). $A = \frac{6}{8} = \frac{3}{4} = \frac{15}{20} = 0.75$ ✗ $B = \frac{5}{10}$ (less than $\frac{6}{10}$) = 0.5 ✗ $C = \frac{2}{3} = 0.67$ (in between $\frac{6}{10}$ and $\frac{15}{20}$) ✓ $D = \frac{12}{15} = \frac{4}{5} = \frac{16}{20} = 0.8$ (greater than $\frac{15}{20}$) ✗ $E = \frac{77}{100} = 0.77$ (greater than $\frac{75}{100}$, so greater than $\frac{15}{20}$) ✗

Number: Place Value (page 8)

1	A	The ten thousands digit is the fifth digit from the right. Only A has a 3 in that position. i.e. 1 <u>3</u> 6,472.
2	D	Thirty thousand is 30,000; eight hundred is 800; and four is 4. Adding these up gives 30,804.
3	B	The first six represents 60,000 and the second 6 represents 60. The difference is $60,000 - 60 = 59,940$
4	D	D is 98 away from 35,150. All other answers are at least 100 away.
5	C	The results of swapping the digits are A: 473,605, B: 734,605, C: 746,305, D: 743,065 and E: 743,650. C gives the largest answer.
6	A	B has fewer tenths (6) than tens (7). C has more hundredths (7) than ones (5). D has more hundredths (9) than ones (6). E has an even number of hundredths (6). So the answer is A.

Number: Prime Numbers (page 9)

1	E	13, 43, 61, and 79 are only divisible by 1 and themselves. The others are all divisible by 3: $27 = 3 \times 9$ $39 = 3 \times 13$ $57 = 3 \times 19$ $87 = 3 \times 29$
2	C	42 can be written as $2 \times 3 \times 7$
3	D	A ends in 5 so is divisible by 5. B, C and E end in even numbers so are divisible by 2.
4	B	The first five prime numbers are 2, 3, 5, 7 and 11. Their sum is 28.
5	C	A contains 49, which is 7×7 . B contains 63, which is 3×21 . D contains 39, which is 3×13 . E contains 93, which is 3×31
6	C	The prime numbers between 40 and 50 are 41, 43 and 47. Their sum is 131.
7	E	92 can be written as $2 \times 2 \times 23$, so the answer is E.
8	D	$3 \times 23 = 69$ All the other numbers are prime numbers.

Number: Square and Cube Numbers (page 10)

1	D	$5 \times 5 = 25$
2	D	The primes between 10 and 20 are 11, 13, 17 and 19. The answer must be even, as we are adding two odd primes together, and the answer must be greater than 20, as we are adding two primes each greater than ten. $17 + 19 = 36$
3	C	$1^2 = 1$, $4^3 = 64$, and $3^3 = 27$ $1 + ? = 64 - 27$ $1 + ? = 37$ $? = 36 = 6^2$
4	A	$11^2 = 121$, $7^2 = 49$, and $121 - 49 = 72$
5	C	$9^2 = 81$, $2^2 = 4$, and $81 + 4 = 85$ This is equal to C as $7^2 + 6^2 = 49 + 36 = 85$
6	A	Ninth square: $9^2 = 81$, fourth square: $4^2 = 16$ So $9^2 - 4^2 = 81 - 16 = 65$
7	B	$6^2 + 4^3 = 36 + 64 = 100 = 10^2$
8	E	$4^3 = 64$, $7^2 = 49$ and $9^2 = 81$, so the order is E: 27 7^2 4^3 9^2

Number: Rounding (page 11)

1	E	4.73m is between 4.7m and 4.8m and closer to 4.7m.
2	E	A and C round to 76.8 as they are greater than 76.75. B and D round to 76.6 as they are less than 76.65.
3	C	A and D round to 7 miles as they are less than 7.5 miles. B and E round to 9 miles as they are greater than 8.5 miles.
4	A	16.485 is between 16.48 and 16.49. The convention is that a number exactly halfway between rounds up.
5	B	£2655 is between £2650 and £2660 and rounds to £2660 as it is exactly halfway between.
6	A	A is between 6,940,000 and 6,950,000 and is closer to 6,950,000. Answers B and D round to 6,960,000. Answers C and E round to 6,940,000.
7	D	100 grams is 0.1kg. 129.48kg is between 129.4kg and 129.5kg and is closer to 129.5kg.

Number: Operations (page 12)

1	A	The total number of meals is $849 + 1086 + 937 = 2872$
2	D	When dividing 1344 by 24 rather than 12, the division is into twice as many parts, so each part will be half the size. So the answer is half of 112, which is 56.
3	B	$6 + 12 = 18$ $6 \times 12 = 72$ $7 + 11 = 18$ $7 \times 11 = 77$ $8 + 10 = 18$ $8 \times 10 = 80$ $9 + 9 = 18$ $9 \times 9 = 81$ The product 75 can't be made.
4	E	There is one left over when he makes two piles, so he must have an odd number of marbles. There is also one left over when he makes three piles so multiples of three plus one are: $69 + 1 = 70$ (already ruled out because it's even) $72 + 1 = 73$
5	D	Start with 0 or any number. Double 0: $0 \times 2 = 0$ Add 5: $0 + 5 = 5$ Double 5: $5 \times 2 = 10$ Add 6: $10 + 6 = 16$ Divide by 4: $16 \div 4 = 4$ Difference: $4 - 0 = 4$
6	C	Product: $8 \times 9 = 72$ Sum: $8 + 9 = 17$ Difference: $72 - 17 = 55$

Number: Patterns and Sequences (page 13)

1	D	The first term is $4 \times 1 = 4$, the second term is $4 \times 2 = 8$, etc.
2	A	Each term is the sum of the previous two terms (Fibonacci sequence). The sequence continues 13, 21, 34, 55, 89, 144, so the answer is A.
3	E	Each term is three more than the previous term. The sequence continues 1, 4, 7, so the answer is E.
4	C	The sequence is 13, 9, 5, 1, -3, -7, ... so C is in the sequence.
5	B	Each term is multiplied by 3 to give the next term. $0.3 \times 3 = 0.9$ $0.9 \times 3 = 2.7$ $2.7 \times 3 = 8.1$
6	D	The difference between terms is 21. $-16 + 21 = 5$ $5 + 21 = 26$ $26 + 21 = 47$

Number: Fractions and Decimals (page 14)

1	E	$\frac{9}{10} = 0.9$, $\frac{1}{4} = 0.25$, $0.9 - 0.25 = 0.65$
2	A	$\frac{1}{5} = 0.2$ so 6.2 and $6\frac{1}{5}$ are the same.
3	C	The largest is 1.7 and the smallest is 0.27 and $1.7 - 0.27 = 1.43$
4	A	$0.28 = \frac{28}{100}$ This is equivalent to $\frac{14}{50}$ and $\frac{7}{25}$. The correct answer is $\frac{7}{25}$ as it asks for it in its simplest form. $\frac{2.8}{10}$ is an incorrect fraction, decimals are not used in fractions. $\frac{28}{10} = 2.8$
5	C	The decimal point is fixed and the digits move five places to the left, so the divisor needs to have five zeros, therefore one hundred thousand.
6	E	1km = 1000m so 0.309km = 309m 1m = 100cm, so 309m = 30,900cm
7	D	Thirteen full boxes have 156 cakes ($13 \times 12 = 156$), so four cakes are left over. Those four cakes are $\frac{4}{160}$ of the original cakes, which is equivalent to $\frac{1}{40}$.

Number: Percentages (page 15)

1	A	15% of 64 is 9.6. The other answers are B: 9, C: 8.8, D: 9 and E: 9.5.
2	B	16% of 2500 is 400 10% of 2500 = 250 5% of 2500 = 125 (half of 10%) 1% of 2500 = 25 (one fifth of 5%)
3	D	$250 \div 200 = 1.25$, which is 125%.
4	B	$0.31 = \frac{31}{100}$ which is 31%.
5	D	$\frac{18}{75} = \frac{6}{25} = \frac{24}{100} = 24\%$
6	C	He cycled 87 miles between punctures, as 30% of 290 is 87. So he had $290 - 125 - 87 = 78$ miles remaining.
7	D	There were 40 people in total, and $\frac{8}{40} = \frac{2}{10} = \frac{20}{100} = 20\%$.

Number: Logical Questions (page 16)

1	E	The answer is 6 as: $6 \times 4 = 24$; half of 24 is 12; and $12 - 9 = 3$ $3 + 9 = 12$ $12 \times 2 = 24$ $24 \div 4 = 6$
2	B	92 children went in week 2, as $23 \times 4 = 92$ 46 went in week 3, as $92 \div 2 = 46$
3	A	$\frac{1}{5}$ of 45 = 9. I will be 60 in 15 years' time, as $60 - 45 = 15$ My daughter will then be $9 + 15 = 24$
4	D	The six possible half-time scores are 0-1, 0-2, 0-3, 1-2, 1-3 and 2-3.
5	D	There are $6 + 2 = 8$ socks that aren't red, so there could be no red socks among the first eight socks taken out. Two more socks are needed to ensure he has a pair of red socks. So $8 + 2 = 10$
6	C	

Algebra: BIDMAS (page 17)

1	D	Division comes before addition. So $12 + 20 \div 4 = 12 + 5 = 17$
2	C	Division comes before subtraction. So $27 - 9 \div 3 = 27 - 3 = 24$
3	E	Brackets come first. So $18 \div (3 \times 2) = 18 \div 6 = 3$
4	C	Brackets come first. So $(5 + 2) \times 12 \div 6 = 7 \times 12 \div 6$ Then multiplication and division from left to right $7 \times 12 \div 6 = 84 \div 6 = 14$
5	A	A is correct since $12 \div (3 + 1) \times 4 = 12 \div 4 \times 4$ (brackets first) $12 \div 4 \times 4 = 3 \times 4$ (then division and multiplication left to right) $3 \times 4 = 12$
6	D	Farmers have an average of $76 + 112$ animals. And there are 63 farmers, so the total is $63 \times (76 + 112)$

Algebra: Simple Linear Equations (page 18)

1	C	Start with $4x - 6 = 18$ Add 6 to each side to get $4x = 24$ Then divide each side by 4 to get $x = 6$
2	D	As he started with six pairs and finished with 54, he must have bought 48. Dividing by 3 gives 16 as the number of pairs in each box.
3	C	As Aisha has three times as many sweets as Shiven, Shiven has one quarter of the total sweets. One quarter of 48 is 12. So Aisha has the remaining 36.
4	E	Write R for Rex's weight, S for Sam's, and T for Tim's. $(R + S) + (S + T) - (R + T) = 2S$ $R + S = x \quad R + T = y \quad S + T = z$ So, $x + z - y = 2S$ so $\frac{1}{2}(x + z - y) = S$
5	E	Each class has $(p + 1)$ people, including the teacher. There are cy classes. So the number of people is $cy(p + 1)$.

Ratio and Proportion: Speed, Distance, Time (page 19)

1	B	40 minutes is $\frac{2}{3}$ of an hour. She runs 9 miles in 1 hour and 6 miles in $\frac{2}{3}$ of an hour, so 15 miles in total.
2	E	40 minutes is $\frac{2}{3}$ of an hour. So Leon cycled $\frac{2}{3} \times 21 = 14$ km. Craig cycled the same 14km in $\frac{1}{2}$ an hour so would have cycled 28km in an hour, or 28km/h.
3	C	3mph is the same as 20 minutes per mile, so Abdul takes 40 minutes and arrives at 8.55am, on time. 30mph is the same as 2 minutes per mile, so Kane takes 34 minutes and arrives at 9.04am, late. 12mph is the same as 5 minutes per mile, so Laila takes 20 minutes and arrives at 8.56am, on time. 20mph is the same as 3 minutes per mile, so Shobana takes 24 minutes and arrives at 9.04am, late. So two people are on time.
4	A	They cover 45 miles each hour, so would cover 225 miles in 5 hours. The remaining 30 miles would take $\frac{30}{45}$ of an hour, equal to $\frac{2}{3}$ of an hour, equal to 40 minutes. So they take 5 hours 40 minutes.

Ratio and Proportion: Word Problems (page 20)

1	E	100ml costs 90p. So 50ml costs 45p and 200ml costs 180p. In total 250ml costs 225p or £2.25.
2	C	Fruit juice is $\frac{3}{5}$ of the drink. $\frac{1}{5}$ of 3.5 litres is 0.7 litres, so $\frac{3}{5}$ of 3.5 litres is 2.1 litres.
3	A	$\frac{7}{12}$ of the paint is yellow. $\frac{1}{12}$ of the paint is 50ml, so $\frac{7}{12}$ of the paint is 350ml.
4	E	Each 1cm on the plan is 6m in real life. So 3cm on the plan is 18m in real life and 0.5cm on the plan is 3m in real life. In total, 3.5cm on the plan is 21m in real life.
5	C	One dozen is 12 so he has 24 eggs. That will make 8 cakes. The other ingredients weigh $175\text{g} + 175\text{g} + 175\text{g} = 525\text{g}$ per cake. Multiplying that by 8 for 8 cakes gives 4200g, which is 4.2kg.

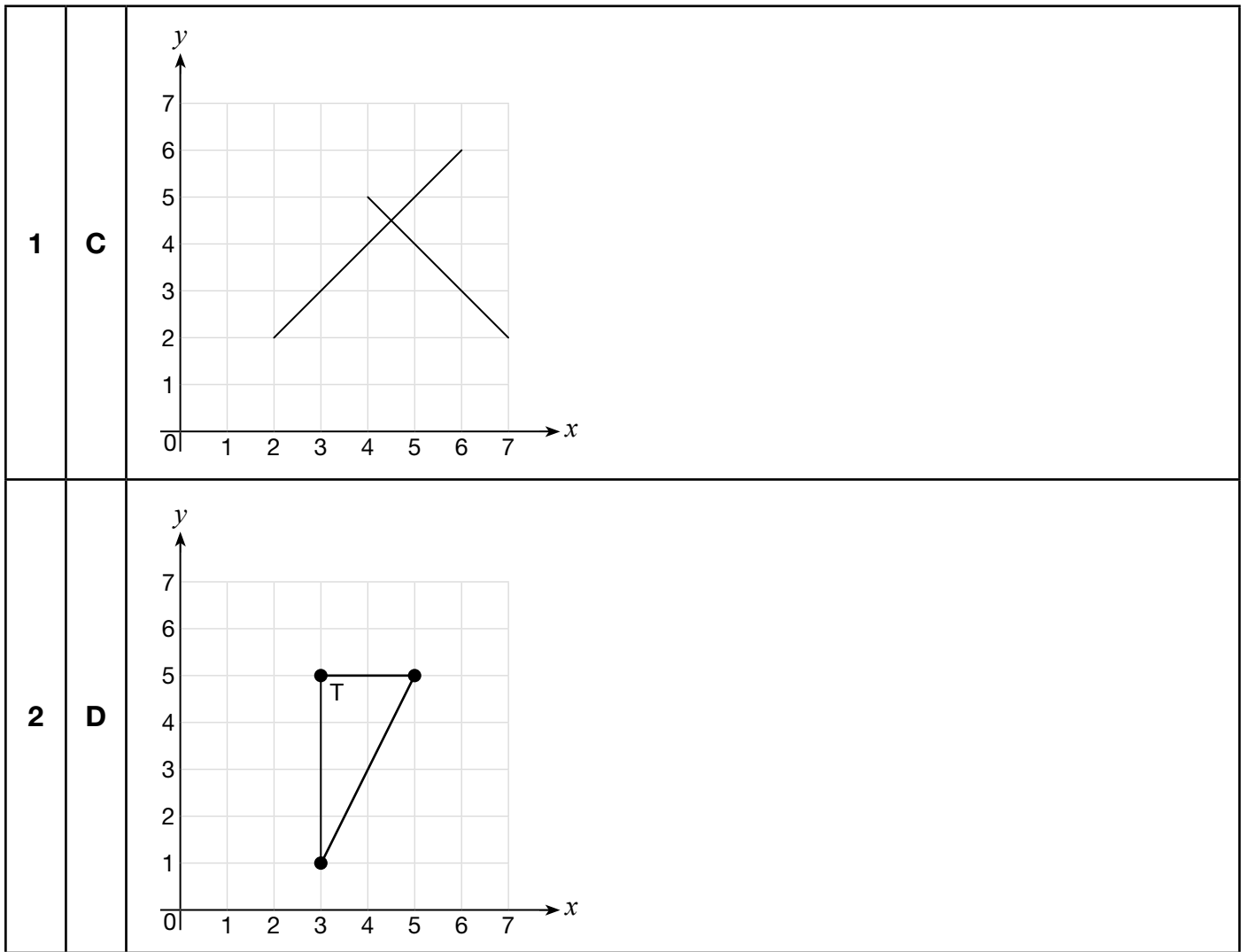
Geometry: 2D & 3D Shapes (page 21)

1	D	A regular hexagon has internal angles of 120° so that statement is false. The other three are true.
2	C	Points 2, 3, 5 and 6 make a rectangle, which has four right angles. So points 2, 3 and 6 make a right-angled triangle.
3	B	He needs: 4 triangles for the tetrahedron 6 squares for the cube 2 triangles and 3 squares for the triangular prism. So he needs 6 triangles and 9 squares in total.

Geometry: Angles (page 22)

1	B	Because the triangle is isosceles, the lower right angle is also 74° . Angles in a triangle add up to 180° , so the angle at the top of the triangle is $180^\circ - 74^\circ - 74^\circ = 32^\circ$ Angle n is the same, as this is an opposite angle.
2	B	Angles on a straight line add up to 180° , so the angle to the left of the 50° angle is 130° . The left-hand triangle is isosceles as two of its sides are a radius of the circle. So the other angles of the left-hand triangle are equal, and must each be 25° as that the total for the triangle is 180° .
3	C	Three angles including angle a meet at a point so must add up to 360° . A regular pentagon has an interior angle of 108° . A regular hexagon has an interior angle of 120° . So angle a must be $360^\circ - 108^\circ - 120^\circ = 132^\circ$

Geometry: Coordinates (page 23)



Geometry: Reflections and Translations (page 24)

1	B	
2	C	d is initially 3 to the right and 4 up from f. After rotating it will be 4 to the right of f and 3 below it. So d goes to (7, -2).
3	A	Point A is 4 units to the right of the vertical dashed line. After reflecting, it will be 4 units to the left, so at (-3, 3).

Measurement: Mass (page 25)

1	B	20cm is $\frac{1}{5}$ of 1m and 25cm is $\frac{1}{4}$ of 1m. So the rectangle is $\frac{1}{4} \times \frac{1}{5} = \frac{1}{20}$ of a square metre. So it weighs $\frac{1}{20}$ of 180g, which is 9g.
2	B	A 1p coin weighs 3.56g, so ten 1p coins weigh 35.6g. A 10p coin weighs 6.5g. So the difference between ten 1p coins and one 10p coin is 29.1g.
3	C	4kg is the weight of a large human baby, so much smaller than an adult chimp. 400kg is much heavier than the average human adult, so much larger than an adult chimp.
4	A	100,000g is 100kg, which is the weight of a large adult human. The others might weigh about 20g (mouse), 2kg (rabbit), 5000kg (elephant) and nearly 200,000kg (blue whale).
5	D	The delivery weighs $8 \times 12.5\text{kg} = 100\text{kg}$, which is 100,000g. Two packets would weigh 100g, so 2000 packets would weigh 100,000g.

Measurement: Length (page 26)

1	C	The marks on the ruler are 0.25cm apart. The arrows are at 8.75cm and 10.25cm, so the distance between them is 1.5cm, which is 15mm.
2	E	One mile is about 1.6km. So each child runs about 0.4km and between them, they run $30 \times 0.4\text{km} = 12\text{km}$
3	D	0.81m divided by 3 is 0.27m. There are 1000mm in 1m, so 0.27m is 270mm.
4	A	The distance from R to U is 23cm + 0.57m, which is 23cm + 57cm = 80cm or 800mm The distance from R to T is 765mm so the distance from T to U is $800\text{mm} - 765\text{mm} = 35\text{mm}$
5	D	The snail moves 12.5cm every minute, so it moves 1m in 8 minutes. 0.02km is equal to 20m. So it takes $8 \times 20 = 160$ minutes to move 20m.

Measurement: Area (page 27)

1	C	We can think of the area as a large rectangle with a smaller rectangle removed. The large rectangle has an area of $7\text{m} \times 5\text{m} = 35\text{m}^2$ The sides of the smaller rectangle are not given. Comparing the top and bottom of the large rectangle, the width of the smaller rectangle is $7\text{m} - 4\text{m} = 3\text{m}$ Comparing the right and left of the large rectangle, the height of the smaller rectangle is $5\text{m} - 3\text{m} = 2\text{m}$ So the smaller rectangle has an area of $3\text{m} \times 2\text{m} = 6\text{m}^2$ The shape then has an area of $35\text{m}^2 - 6\text{m}^2 = 29\text{m}^2$
2	B	We can think of the area as a square minus two triangles. The area of the square is $3\text{cm} \times 3\text{cm} = 9\text{cm}^2$ The area of the bottom-right triangle is $\frac{1}{2} \times 2\text{cm} \times 2\text{cm} = 2\text{cm}^2$ The area of the bottom-left triangle is $\frac{1}{2} \times 1\text{cm} \times 3\text{cm} = 1\frac{1}{2}\text{cm}^2$ The area of Mo's shape is then $9\text{cm}^2 - 2\text{cm}^2 - 1\frac{1}{2}\text{cm}^2 = 5\frac{1}{2}\text{cm}^2$
3	C	We can think of the area as two triangles. The area of the top triangle is $\frac{1}{2} \times 4\text{cm} \times 2\text{cm} = 4\text{cm}^2$ The area of the bottom triangle is $\frac{1}{2} \times 4\text{cm} \times 6\text{cm} = 12\text{cm}^2$ The total is $4\text{cm}^2 + 12\text{cm}^2 = 16\text{cm}^2$

Measurement: Perimeter (page 28)

1	C	Each side of the middle white triangle is twice as long as a side of the grey triangle (2cm). Each side of the outer triangle is twice as long as a side of the middle triangle (4cm). So the perimeter of the outer triangle is $4\text{cm} \times 3 = 12\text{cm}$.
2	E	First find the length of the unmarked vertical section. $7\text{cm} - 2.5\text{cm} - 2.5\text{cm} = 2\text{cm}$ Perimeter: $5\text{cm} + 2.5\text{cm} + x\text{cm} + 2\text{cm} + x\text{cm} + 2.5\text{cm} + 5\text{cm} + 7\text{cm} = 24\text{cm} + 2x\text{cm}$ $2x = 33\text{cm} - 24\text{cm} = 9\text{cm}$ so $x = 4.5\text{cm}$
3	D	D has a perimeter of 18. The other shapes all have shorter perimeters. When measuring their perimeters, the diagonal lines are greater than 1 but shorter than 2. For example, A consists of 14 horizontal and vertical lines and 2 diagonals with a combined length of less than 4. So the perimeter of A is less than 18.

Measurement: Capacity/Volume (page 29)

1	B	Volume of each cube: $2\text{cm} \times 2\text{cm} \times 2\text{cm} = 8\text{cm}^3$ Total cubes needed: $80\text{cm}^3 \div 8\text{cm}^3 = 10$ Additional cubes needed: $10 - 6 = 4$
2	B	The building can be thought of as a $10\text{m} \times 5\text{m} \times 4\text{m}$ cuboid minus an $8\text{m} \times 2\text{m} \times 4\text{m}$ cuboid. So its volume is $200\text{m}^3 - 64\text{m}^3 = 136\text{m}^3$
3	C	The volume of the tank is $80\text{cm} \times 40\text{cm} \times 50\text{cm} = 160,000\text{cm}^3$ One litre of water fills 1000cm^3 , so the tank will hold 160 litres.

Measurement: Money (page 30)

1	D	$£3.65 + £1.95 + £1.20 = £6.80$
2	C	The perimeter is $100\text{m} + 50\text{m} + 100\text{m} + 50\text{m} = 300\text{m}$. One metre is 1000mm $1000\text{mm} \div 20\text{mm} = 50$ so each metre of perimeter needs 50 coins. So they need $50 \times 300 = 15,000$ coins worth 15,000p, which is £150.
3	D	The difference of 30p between 85p and £1.15 would buy two extra bananas. So one banana costs 15p. So three bananas cost 45p. $85\text{p} - 45\text{p} = 40\text{p}$ for two apples So each apple costs 20p. So six apples cost £1.20.
4	B	It is easier to compare the cost of 12 eggs. A costs $19\text{p} \times 12 = 228\text{p}$ B costs $4 \times 55\text{p} = 220\text{p}$ C costs $3 \times 75\text{p} = 225\text{p}$ D costs $2 \times 115\text{p} = 230\text{p}$ E costs 225p So B is the cheapest for 12 eggs and will also be the cheapest for 120 eggs.

Measurement: Time (page 31)

1	C	The answers all use the 24-hour system. The time shown is 7.45pm, which is written as 19:45 in the 24-hour system.
2	D	55 minutes plus 55 minutes equals 110 minutes, which is 1 hour 50 minutes.
3	B	1 minute is 60 seconds. 1 hour is $60 \times 60 = 3600$ seconds 1 day is $3600 \times 24 = 86,400$ seconds; 10 days is $86,400 \times 10 = 864,000$ seconds 5 days would be 432,000 seconds and 1 month would be over 2 million seconds, so B is closest.
4	C	From 9.45pm to 10.00pm is 15 minutes. From 10.00pm to midnight is 2 hours or 120 minutes. From midnight to 6.00am is 6 hours or 360 minutes. From 6.00am to 6.30am is 30 minutes. The total is $15 + 120 + 360 + 30 = 525$ minutes.

Statistics: Pictograms (page 32)

1	D	There are $12\frac{1}{2}$ wheels, so the answer must be a multiple of $12\frac{1}{2}$. The multiples of $12\frac{1}{2}$ are $12\frac{1}{2}, 25, 37\frac{1}{2}, 50, 62\frac{1}{2} \dots$ so the answer must be 50.
2	B	Wednesday had $3\frac{1}{2}$ droplets for 7mm so each droplet is 2mm. In total, there are 9 droplets representing 18mm.

Statistics: Bar Charts (page 33)

1	A	We don't know the scale of the chart, but it will not affect the answer. Assume that each gridline represents two books, then Daisy has $1 + 2 + 10 + 8 + 6 = 27$ books. The median is then the 14 th book. It must then be in the range of 300–399 as there are 13 books below there. The only answer in that range is 350. The answer is not affected by the scale of the chart because it will affect the number of books above and below the median in the same way.
2	E	0–2 penalties were scored $2 + 3 + 3 = 8$ times, but 4–5 penalties were scored $5 + 2 = 7$ times, so E is false.

Statistics: Pie Charts (page 34)

1	D	We have 360° for 90 children so each child is represented by 4° . So 34 children are represented by $34 \times 4^\circ = 136^\circ$
2	C	$\frac{1}{8}$ of Felix's coins are £1, so he has 10. $\frac{1}{4}$ of Ivan's coins are £1 so he has 15. So they have 25 in total.

Statistics: Line Graphs (page 35)

1	B	The maximum is 19 hours, and the minimum is 5 hours, so the difference is 14 hours.
2	D	Darius improved from 28 seconds to 22 seconds, an improvement of 6 seconds. Other improvements are smaller: 4 seconds for Basia, 1 second for Callum, 5 seconds for Ethan, and Ari got slower.

Statistics: Mean, Median, Mode, Range (page 36)

1	A	Expressing them all in metres, using 1600m to a mile, they are A: 16m, B: 18.62m, C: 12.3m, D: 9.876m and E: 40m. So 16m is the middle value and A is the answer.
2	E	If she scores 8 then her total score would be $14 + 18 + 14 + 16 + 8 = 70$ giving a mean of 14, and the median would be the third highest value, also 14.
3	B	The total cost is $\text{£}6 \times 60 + \text{£}3 \times 90 = \text{£}630$ for $(60 + 90) = 150$ people The mean price is $\text{£}630 \div 150 = \text{£}4.20$
4	D	The lowest temperature is -1.4°C and the highest temperature is 4.7°C . $4.7^\circ\text{C} - (-1.4^\circ\text{C}) = 4.7^\circ\text{C} + 1.4^\circ\text{C} = 6.1^\circ\text{C}$
5	C	There are $8 + 9 + 6 + 2 = 25$ students. The mode is the most common grade = 4 The median is the middle (13th) grade = 4 The total score is $(5 \times 8) + (4 \times 9) + (3 \times 6) + (2 \times 2) = 40 + 36 + 18 + 4 = 98$ Mean is $98 \div 25$ which is less than 4. So mean < median and median = mode.

Statistics: Venn Diagrams (page 37)

1	D	Fifteen people go to choir (those in the choir circle). Five go to both choir and recorder (those in the intersection of the choir and recorder circles). So the fraction of those who go to choir who also go to recorder club is $\frac{5}{15}$ which is $\frac{1}{3}$.
2	D	The number studying exactly two languages is: 12 (French and Mandarin) + 3 (Mandarin and German) + 16 (French and German) = 31

Statistics: Timetables (page 38)

1	A	At that time of night, trams arrive at George Road at 2, 12, 22, 32, 42 and 52 minutes past the hour. The latest suitable arrival time at George Road would be 22:22. It takes 45 minutes to get from the Business Park to George Road, so he needs to leave at 21:37 or 9.37pm.
2	D	Nicola's next train to Brighton is the 12:19, arriving at 12:37. Sarah's next train to Brighton is the 11:58, arriving at 12:14. So they can meet at 12:37, in 42 minutes.
3	B	The arrival time is 2.15pm in New York time. This is 5 hours behind London so equivalent to 7.15pm London time. It is 8 hours from 11.15am London time to 7.15pm London time.

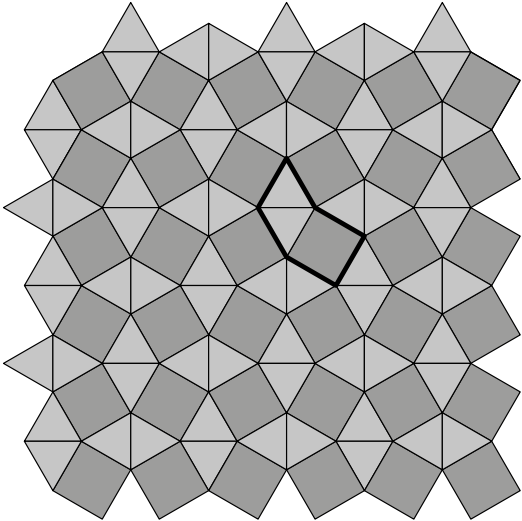
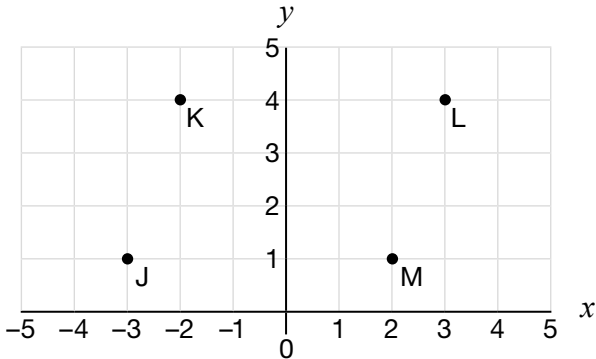
Practice Paper 1 (pages 39–45)

1	D	A pint is 568ml. A spoon is smaller and the other three answers are larger.
2	E	We can work out the areas of the shapes as combinations of squares and triangles. E has an area of 6.5 (4 for the complete squares, 1.5 for the triangle on the left and 1 for the triangle on the right). The others have an area of 6.
3	E	3 teachers take 40 minutes to mark 15 papers. 1 teacher would take 40 minutes to mark 5 papers = 8 minutes per paper $400 \text{ papers} \times 8 \text{ minutes per paper} \div 8 \text{ teachers} = \text{minutes taken}$ ($\times 8$ and $\div 8$ cancel each other out) So it would take 400 minutes for 8 teachers to mark 400 papers 400 minutes is 6 hours 40 minutes.
4	A	First work out 4 as a percentage of 4000: $4 \div 4000 = 0.001$, $0.001 \times 100 = 0.1\%$ 8 is double 4, so double the percentage: $0.1\% \times 2 = 0.2\%$
5	E	$5 \times 5 = 25$ and $25 \times 25 = 625$
6	A	$\star + \star + \star = 39$, so $\star = 39 \div 3 = 13$ $\star + \blacksquare + \star = 36$, so $\blacksquare = 36 - 13 - 13 = 10$ $\blacksquare + \bullet + \blacksquare = 28$, so $\bullet = 28 - 10 - 10 = 8$
7	C	41, 43, 47 and 53 are all prime numbers. A total of 45 could be 9 holes scoring 5 per hole or 5 holes scoring 9 per hole.
8	E	$\frac{15}{4} = 3\frac{3}{4} = 3.75$, which is between 3.45 and 3.85. The other values are equivalent to A: 3.4, B: 4, C: 4.5, D: 3.3
9	B	(7, 6) and (2, 1) would make a rhombus. A makes a square with four lines of symmetry. C and E make a parallelogram with no lines of symmetry. D makes a trapezium with one line of symmetry.
10	E	One discounted ticket costs £6 rather than £8, so 24 tickets cost $\text{£}6 \times 24 = \text{£}144$
11	C	In the second set of numbers, four are the same as in the first set and the other has increased 3000. So the total increases by 3000 and the average increases by $3000 \div 5 = 600$ So the new mean is $50,000 + 600 = 50,600$
12	A	Follow the BIDMAS rules. $(2^3 + 4) + 42 \div 6 = (8 + 4) + 42 \div 6 = 12 + 42 \div 6 = 12 + 7 = 19$
13	B	An inch is approximately 2.5cm, so 40 inches is approximately 100cm.
14	C	Each term is twice the previous term, so the sequence is 2, 4, 8, 16, 32, 64, 128, ... and the first term above 100 is 128.
15	A	At the top of the diagram, the interior angle of the pentagon plus two angles of 36° (by symmetry) make a straight line of 180° . So the interior angle is 108° . At the bottom, angle s and an interior angle of the pentagon also make a straight line of 180° . $180^\circ - 108^\circ = 72^\circ$ so s is 72°
16	D	Harvey calculates $12,000 + 53 + 900 + 6000 + 79$, so the answer is 19,032 which has 5 digits.
17	E	There is a difference of 20 between 7 and 27, this is made of 5 steps. So the difference between adjacent numbers marked on the line is 4. Therefore the numbers shown would be -5, -1, 3, 7, 11, 15, 19, 23, 27, 31 and 35. So statement E is incorrect.
18	C	There are 1000g in 1kg. So the otter weighs 26,300g.

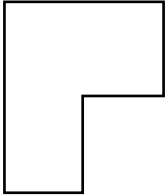
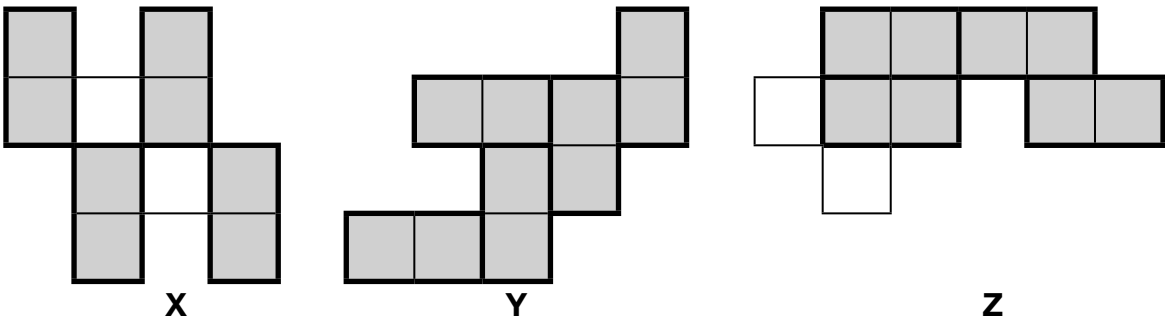
19	D	Imagine a new point one grid length up and to the right of point 2. That point together with points 1, 4 and 5 makes a square. So 1, 4 and 5 make a right angle.
20	B	Simone drives at 50mph which is 1.2 minutes per mile. So she takes 24 minutes for 20 miles. Diego drives at 40mph which is 1.5 minutes per mile. So he takes 30 minutes for 20 miles. The difference is 6 minutes.
21	D	Each change of 1°Z is equivalent to a change of 5°C . We have that: $5^{\circ}\text{Z} = 0^{\circ}\text{C}$, so $4^{\circ}\text{Z} = -5^{\circ}\text{C}$, $3^{\circ}\text{Z} = -10^{\circ}\text{C}$, $2^{\circ}\text{Z} = -15^{\circ}\text{C}$, $1^{\circ}\text{Z} = -20^{\circ}\text{C}$ and $0^{\circ}\text{Z} = -25^{\circ}\text{C}$
22	E	0.7499 is between 0.749 and 0.750 and is closer to 0.750.
23	D	4 metres = 400 centimetres and 4 millimetres = 0.4 centimetres. $400\text{cm} + 4\text{cm} + 0.4\text{cm} = 404.4\text{cm}$
24	A	101 is prime as it can only be divided by 1 or itself. 111 is divisible by 3. 103, 113 and 107 are prime but larger than 101.
25	C	Compared to the original calculation, 3.6 is $\frac{1}{100}$ of 360 and 8.4 is $\frac{1}{10}$ of 84. So 3.6×8.4 is $\frac{1}{1000}$ of the original answer, so 30.24.

Practice Paper 2 (pages 46–52)

1	D	$65\% + 5\% = 70\%$ of tickets sold at the beginning and end of ticket sales. Leaving 30% sold in between those times. 30% of 580 = 174 (10% of 580 = 58 and $58 \times 3 = 174$)
2	A	Angles in a triangle add up to 180° and an isosceles triangle has two equal angles. In the middle triangle, one angle is 36° so the other two must be 72° . In the triangle on the right, one angle is 90° so the other two must be 45° . So $x = 72^{\circ} + 45^{\circ} = 117^{\circ}$
3	D	The cook buys 6×2.5 litres = 15 litres. There are 1000ml in one litre, so this is 15,000ml. So it would fill $15,000 \div 300 = 50$ bottles
4	D	The number of children who chose other subjects is $3 + 4 + 2 + 7 + 6 = 22$. So there are $30 - 22 = 8$ children who chose maths.
5	D	The other answers are approximately 40,000km (equator), 1km (tallest building), 30km (England to France) and 400,000km (to the Moon).
6	E	The perimeter is 34 units where one unit is the side length of a grid square. Each unit is 5m. So $34 \times 5\text{m} = 170\text{m}$
7	B	$\frac{3}{4}$ of the mixture is water, 1.6 litres is 1600ml, and $\frac{3}{4}$ of 1600ml is 1200ml.
8	A	There are $20 + 34 + 18 = 72$ penguins, so $\frac{18}{72}$ are king penguins and $\frac{18}{72} = \frac{1}{4}$.
9	B	The average price is the total price (£36) divided by the number of people (2 + 4).
10	E	$10^2 = 100$ and $8^2 = 64$ so $10^2 - 8^2 = 100 - 64 = 36$, which is 6^2 .
11	C	Freya's journey takes $13 + 3 + 32 + 6 = 54$ minutes. That is between 50 and 55 minutes and closer to 55 minutes.
12	D	The temperatures are -3°C and $+8^{\circ}\text{C}$ so the difference between them is 11°C .
13	A	The hundred thousands digit is the sixth from the right, so it is 2.

14	B	The weekly totals are $2 + 4 + 1 = 7$, $3 + 0 + 5 = 8$, $3 + 3 + 2 = 8$ and $4 + 2 + 4 = 10$. So 7 is the fewest.
15	C	Asim pays 80% of the original price. So 80% is £360. So 20% is £90 and 100% is £450.
16	D	Keeley's sequence is $1, 2\frac{3}{4}, 4\frac{1}{2}, 6\frac{1}{4}, 8, 9\frac{3}{4}, \dots$ so 8 is in the sequence.
17	E	$\frac{3}{4}$ of 144 is 108.
18	B	$105 = 3 \times 5 \times 7$
19	C	The arrow is one third of the way from 1 to 2 so it is at $1\frac{1}{3}$, which is equal to $\frac{16}{12}$.
20	D	In a division, multiplying both numbers by the same amount does not change the answer. $6.24 \div 0.4 = (6.24 \times 100) \div (0.4 \times 100) = 624 \div 40$
21	A	<p>Colouring the diagram like this shows that the pattern consists of 'units' shown with the thick outline. Each unit has two triangles and one square, so $\frac{2}{3}$ of the shapes are triangles.</p> 
22	B	Using BIDMAS, $9 \times (6 - 3)^2 = 9 \times 3^2 = 9 \times 9 = 81$
23	E	
24	C	The segment for daisy is roughly a quarter of the circle. So roughly $\frac{1}{4} \times 100 = 25$ chose daisies.
25	B	9.02 is 0.98 from 10. The others are A: 0.09, C: 0.01, D: 0.89 and E: 0.82 from 10.

Practice Paper 3 (pages 53–59)

1	D	The normal series last $3 \times 9 \times 30 = 810$ minutes. The specials last $2 \times 2 \times 30 = 120$ minutes. So a total of $810 + 120 = 930$ minutes which is 15 hours 30 minutes.
2	D	The volume of a cuboid is length \times width \times height. D has a volume of $8 \times 4 \times 7 = 224$ The others have volumes of A: 216, B: 210, C: 216 and E: 208.
3	B	This shape has five right angles and one 270° angle. Six right angles are not possible because the angles of a hexagon must add up to 720° and six right angles only make 540° . 
4	C	Boys' initials are used to refer to their speeds. $F:G = 5:4 = 15:12$ $G:H = 3:2 = 12:8$ So $F:G:H = 15:12:8$ and $H:F = 8:15$
5	E	$\frac{3}{4}$ of 64 is 48 and $\frac{2}{3}$ of 27 is 18 so the total is $48 + 18 = 66$
6	A	If they lost 10%, they won or drew 90%. They also won or drew $24 + 3 = 27$ games. So 90% is 27 and 100% is 30.
7	B	They are too late for the 09:50 from Albert Bridge, so must get the 10:20. They can change boats at River Junction or New Bridge and get to the castle at 11:20. That is 85 minutes from now.
8	D	The mean of {7, 8, 9, 10, 15} is $(7 + 8 + 9 + 10 + 15) \div 5 = 49 \div 5 = 9.8$ The other means are A: 9.5, B: 9.75, C: 9.75 and E: 9.67
9	C	She pays $\text{£}10.00 - \text{£}2.80 = \text{£}7.20$ So each ice cream costs $\text{£}7.20 \div 4 = \text{£}1.80$
10	B	3rd March was a Saturday, so March 10th, 17th, 24th, 31st, April 7th, 14th, 21st, 28th, May 5th, 12th and 19th were all Saturdays. Therefore 20th May was a Sunday.
11	D	Evie's dog weighs $15 \times 2.2 = 33\text{lb}$ The difference is $33\text{lb} - 16\text{lb} = 17\text{lb}$
12	B	Shapes X and Z both have two single squares left uncovered however you try to arrange the dominoes. 

13	A	r grams is the same as $(r \div 1000)$ kg. So it needs $(r \div 1000) \times 45 + 20$ minutes
14	B	A square number cannot be prime as $a^2 = a \times a$ There is only one even prime, 2, so the answer is 1.
15	B	1 metre is 100cm, so $30.2\text{m} = 30.2 \times 100 = 3020\text{cm}$
16	C	$8^2 - (\sqrt{9} + 12) + 7 = 64 - (3 + 12) + 7 = 64 - 15 + 7 = 49 + 7 = 56$
17	D	The dashed line divides the hexagon into two quadrilaterals, and halves the angles of 100° and 240° . The angles in the upper quadrilateral are a , b , 120° and 50° . The angles in a quadrilateral sum to 360° so $a + b = 190^\circ$
18	E	$4.63\text{kg} + 6.46\text{kg} = 11.09\text{kg}$ This is between 11.0kg and 11.1kg and closer to 11.1kg.
19	D	For red hair, 60° represents 4 pupils, so the chart has 15° per pupil. The brown angle is $360^\circ - 90^\circ - 60^\circ - 75^\circ = 135^\circ$ This represents $135^\circ \div 15^\circ = 9$ pupils
20	E	The prices are £2.60 (for 57cm), £3.95 (for 78cm), £1.25 (for 21cm) and £3.95 (for 124cm). The total is $\pounds 2.60 + \pounds 3.95 + \pounds 1.25 + \pounds 3.95 = \pounds 11.75$
21	C	$\frac{12}{60} = \frac{1}{5} = 20\%$
22	A	Chloe cycles at 4 minutes per mile. She takes 48 minutes each way, so 96 minutes. Yasmin cycles at 3 minutes per mile to the castle, taking 36 minutes. And 6 minutes per mile back from the castle taking 72 minutes. So $36 + 72 = 108$ minutes in total. So Chloe is 12 minutes faster.
23	B	0.525 is 0.025 from 0.5 and 0.025 from 0.55.
24	A	The first five square numbers are 1, 4, 9, 16 and 25. Their sum is 55.
25	D	For 6B, $2\frac{1}{2}$ bicycles represents 125km, so one bicycle represents 50km. For 6D, there are four bicycles, representing $4 \times 50\text{km} = 200\text{km}$. So Class 6D cycles $200\text{km} - 125\text{km} = 75\text{km}$ further.