Extended answers
for Maths (Ages 9–10)

Properties of numbers pp.6–7

1	The factors of 48 are 1 and 48, 2 and 24, 3 and 16, 4 and 12 and 6 and 8. The difference between 4 and 12 is 8. The answer is 4 and 12.
2	To find the answer, you need to add the two numbers and divide the result by 2. 1780 + 8420 = 10,200. 10,200 ÷ 2 = 5100
3	Using the 12 times table, it can be calculated that 108 is the only number that has 12 as one of its factors. The answer must be C.
4	Using the division rules of 4 (the last two digits are divisible exactly by 4), the answer must be E as A (26), B (38), C (30) and D (14) are not divisible exactly by 4.
5	A is 58 less than 1,324,000. B is 112 less, C is 212 greater, D is 53 less, E is 323 greater. The answer is D.
6	62,823 rounded to the nearest hundred is 62,800 spectators.
7	It is best to multiply all three numbers as a starting point. (7 × 4 × 6) = 168. Then divide by 2. 168 ÷2 = 84. The answer is C.
8	The prime numbers between 60 and 80 are: 61, 67, 71, 73 and 79. The sum of these numbers is 351. The answer is E.
9	Prime factors are factors of a number that are also prime numbers. A: 1 and 20 are not prime numbers. C: 10 and 2 are not both prime numbers. D: 5 and 4 are not both prime numbers. The answer is B because both 2 and 5 are prime numbers.
10	Giving a number to two decimal place means having two digits after the decimal point. Ignore the digit that is the fourth digit after the decimal point. The third digit after the decimal point is higher than 5 so the second digit after the decimal point needs to be rounded up to 9. The answer is A.
11	24,348,098. The digit in bold is in the 10,000 column, therefore its value must be 40,000.
12	Eliminate C and D as these figures are in the millions. Eliminate E as this figure is 940,000. Eliminate A as this figure does not end in a 9. The answer is B.
13	This is a Fibonacci sequence, where the numbers are added to create the following number. 4 + 7 = 11. 7 + 11 = 18. 11 + 18 = 29. So, the next number is 18 + 29 =47.
14	5 squared (5 × 5) is 25. 4 squared (4 × 4) is 16. 25 ×16 = 400. The answer is E.

Addition and subtraction pp.8–9

1	2,400 – 2,122 = 278 seats
2	12 (rooms on the ground floor) + (23 × 3) rooms on floors 1, 2 and 3 (69) + (38 × 2) rooms on floors 5 and 6 = (12 + 69 + 76). The total is 157 guest rooms.
3	4500 litres + 2780 litres + 3500 litres + 3100 litres = 13,880 litres 24,480 litres – 13,880 litres = 10,600 litres of oil
4	The largest lake is the Caspian Sea at 371,000 km². Lake Michigan is 58,000 km². 371,000km² – 58,000km² = 313,000 km²

Extended answers
for Maths (Ages 9–10)

Addition and subtraction pp.8–9

5	£13,343,488 – £9,394,881 = £3,948,607
6	3114 – (56 + 182) (238) = 2876 passengers
7	Weekend sales equal 1216 + 1581 (2797). Weekday sales equal 316 + 342 +260 +564 + 694 (2176). 2797 – 2176 = 621 tins
8	127 miles + 98 miles + 88 miles + 118 miles + 97 miles = 528 miles
9	309 pages + 272 pages + 224 pages + 464 pages + 21 pages = 1,290 pages
10	78 + half of 78 (39) = 117 stickers

Multiplication and division pp.10–11

1	24 × 9 = 216 windows
2	495 ÷ 15 = 33 books This calculation can perhaps be less challenging if the student divides 495 by 3 (165) and then divides the result by 5 (33).
3	36 × 6 = 216. 216 – 6 = 210 bales
4	There are 8 seats in each row (2 + 4 + 2). 8 × 33 = 264 passengers
5	60 ÷ 7 = 8 remainder 4. Therefore, the eighth coop will contain 4 hens.
6	There are 8 + 26 passengers in each carriage (34). 34 × 12 = 408 passengers
7	£165.00 ÷ 6 (Caitlin + 5 friends) = £27.50
8	210 × 40 = 8400 metres
9	3.4kg = 3400g. 3400 ÷ 4 = 850 grams
10	84 x 4 = 336 miles.
11	92 ÷ 4 (Lasvita + 3 friends) = 23. The answer is C.
12	2.25 litres = 2250 millilitres. 2250 ÷ 5 = 450 millilitres. The answer is A.

Extended answers
for Maths (Ages 9–10)

Time pp.12–13

1	09:00 to 15:00 = 6 hours, which is 360 minutes. To find one-quarter of the time, divide by 4. 360 ÷ 4 = 90. 90 minutes = 1 hour 30 minutes
2	09:35 + 10.5 hours = 20:05. 20:05 – 7 hours = 13:05
3	32 minutes × 6 = 192 minutes. 192 minutes = 3 hours 12 minutes
4	The bus is due at 19:24 + 14 minutes (19:38). The bus is running 8 minutes late. 19:38 + 8 minutes = 19:46
5	4.25 hours = 4 hours 15 minutes (240 + 15) = 255 minutes. The answer is A.
6	23 August + 7 days = 30 August. 30 August + 7 days = 6 September. (August has 31 days.)
7	17:50 + 35 minutes = 18:25. 18:25 + 20 minutes = 18:45
8	5.30pm + 40 minutes = 6.10pm. 6.10pm + 10 minutes = 6.20pm. 6.20pm + 15 minutes = 6.35pm
9	The 09:12 service leaves Oxford at 10:26 and arrives in Birmingham at 13:08. The total travel time is 34 minutes + 120 minutes + 8 minutes (162 minutes). The answer is 2 hours 42 minutes.
10	10:31 to 10:55 = 24 minutes. 11:41 to 11:52 = 11 minutes. 12:57 to 13:24 = 27 minutes. 13:59 to 14:28 = 29 minutes. The fastest journey is 11 minutes.
11	10:25 to 15:16 = 291 minutes. 11:36 to 16:18 equals 282 minutes. The difference is 9 minutes.
12	Sydney is 7 hours ahead of Cape Town. Therefore, it will be 08:30 plus 7 hours. The answer is 3:30pm.

Money 1 pp.14–15

1	The difference between the amounts is (£22.60 – £18.80) £3.80. Riya must give Ani half that amount in order for the sums of money to be equal. £3.80 ÷ 2 = £1.90
2	£3.99 × 4 = £15.96. £1.70 × 3 = £5.10. £15.96 + £5.10 = £21.06. £21.06 – £2.50 = £18.56
3	£23.00 – £14.00 = £9.00. £9.00 ÷ 2 = £4.50
4	£50.00 + £8.00 + £2.00 + £2.00 + 50p + 20p = £62.70
5	If the 50p coins total £45.00, there must be 90 coins. 90 × 8 = 720g
6	£19.50 × 14 = £273.00
7	£285.00 ÷ 9.50 = 30 hours
8	Each ride will have 12 (number of seats) × 12 (number of cars) = 144 seats. 144 × £4.50 = £648.00

Extended answers
for Maths (Ages 9–10)

Money 1 pp.14–15

9	Two individual pairs of jeans = £29.99 × 2 (£59.98). The special offer is for two pairs for £50.00. £59.98 – £50.00 = £9.98
10	Three individual hoodies = £9.99 × 3 (£29.97). Four individual sweatshirts = £18.99 × 4 (£75.96). The total equals (£29.97 + £75.96) £105.93. Special offer hoodies = £25.00. Special offer sweatshirts = £75.00. Total special offer = (£25.00 + £75.00) £100.00. The saving is £105.93 – £100.00 = £5.93.
11	In most cases, the cost of the ingredients must be multiplied by 4 as the recipe is for 100 chocolate brownies. There are some exceptions. Butter = £2.00 × 4 (£8.00) Caster sugar = 75p (If buying by the kilogram, only one bag is required as the recipe for 25 brownies requires 250g, so 1000g – 1kg – is needed for 100 brownies.) Eggs = £3.50 × 2 (£7.00) Cocoa powder = £2.20 × 4 (£8.80) Self-raising flour = 90p (125g × 4 = 500g, so only one bag of flour is needed for 100 brownies.) Chocolate chips = £1.20 × 4 (£4.80). The total cost is £30.25.
12	Money received from sales = 100 × £1.50 (£150.00). £150.00 – £30.25 = £119.75

Money 2 pp.16–17

1	9 metres × £3.40 = £30.60
2	Rishi's meal will cost £6.00 + £11.00 + £5.00 (£22.00) – 15%. 15% of £22.00 = £3.30. £22.00 – £3.30 = £18.70
3	Paper clips = £1.99 × 2 (£3.98). Exercise books = £2.45 × 3 (£7.35). Staples = £3.29 × 3 (£9.87). Pencils = £1.90 × 2 (£3.80). Sticky notes = £2.49 × 2 (£4.98). The total is £29.98.
4	0.20 × 742 = £148.40
5	Syed will need to save half of £190.00 (£95.00). £95.00 ÷ £5.00 = 19 weeks
6	If the difference between the change from four packets and three packets is 67p (99p – 32p), each packet of crisps must cost 67p. If Mahin buys four packets, that will cost 67p × 4 (£2.68). The change will be 32p. £2.68 + 32p = £3.00. The answer is A.
7	If all the children pay £10.00 each, the total would be £200.00. The difference between £200.00 and £185.00 is £15.00. This means that a total of 6 students take their own lunch (£15.00 ÷ £2.50 = 6).
8	If Alix received £2.44 change from a £10 note, she must have spent £7.56. The larger cake cost £3.99, so the smaller cake must have cost (£7.56 – £3.99) £3.57.
9	If Jakub received £3.95 change from a £10 note, he must have spent £6.05. The only two items that total £6.05 are the coffee and the ice cream.
10	If Amina received 86p change from two £2 coins (£4.00), she must have spent £3.14. The only two items that total £3.14 are the biscuits and the cheese.

Extended answers
for Maths (Ages 9–10)

Fractions pp.18–19

1	$\frac{1}{6}$ of 240 = 40. $\frac{3}{8}$ of 240 = 90. 90 + 40 =130. 240 – 130 = 110 shoppers
2	There must be $\frac{1}{3}$ left from the delivery. $\frac{1}{3}$ of 4515 = 1505 litres
3	Sean's grandfather must now be 42. $\frac{1}{3}$ of 42 = 14. The answer is E.
4	The rugby team must win $\frac{18}{24}$ matches. Simplified, this is $\frac{3}{4}$.
5	$\frac{16}{112}$ equals $\frac{1}{7}$. Therefore, $\frac{6}{7}$ of the pages do not contain advertisements.
6	40 miles + 450 miles (50 × 9) = 490 miles. If $\frac{7}{12}$ = 490, $\frac{1}{12}$ = 70 miles. $\frac{5}{12}$ = 350 miles
7	$\frac{4}{5}$ of 80 = 64 punnets.
8	$\frac{3}{8}$ of 4000 litres = 1500 litres. 1500 litres + 1800 = 3300 litres
9	$\frac{2}{3}$ of 24m² = 16m². 24m² + 16m² = 40m²
10	2 hours = 120 minutes. $\frac{2}{3}$ of 120 minutes = 80 minutes. 80 minutes = 1 hour 20 minutes
11	A: $\frac{3}{4}$ of 200 = 150. B: $\frac{2}{3}$ of 225 = 150. C: $\frac{1}{8}$ of 900 = 112.50. D: $\frac{1}{4}$ of 600 = 150. E: $\frac{1}{3}$ of 510 = 170. The answer is E.

Decimals pp.20–21

1	12.02 – 4.11 = 7.91
2	$\frac{1}{8}$ = 0.125, therefore $\frac{5}{8}$ = 0.625. The answer is B.
3	266 ÷ 8 = 33.25 litres
4	Each point on the scale equals 0.05, therefore the arrow is pointing to 1.75.
5	3.46 + 1.91 + 0.08 + 40.02 = 45.47
6	60 ÷ 24 = 2.5. 2.5 minutes is 2 minutes 30 seconds.
7	45.32 – (18.43 + 17.87) = 9.02

Extended answers
for Maths (Ages 9–10)

Decimals pp.20–21

8	Poland points = 362.80 + 111.80 + 750.22 (1224.82) France points = 370.40 + 108.66 + 722.28 (1201.34) Italy points = 341.50 + 115.40 + 698.31 (1155.21) Germany points = 368.80 + 127.90 + 702.90 (1199.60) UK points = 312.60 + 120.86 + 712.47 (1145.93) Highest score = 1224.82; lowest score = 1145.93 1224.82 – 1145.93 = 78.89
9	514.829 + 329.077 = 843.906. 843.906 to two decimal places is 843.91.
10	24% of 70 = 16.8
11	15.0m × 6.2m (93.0m²) + 7.8m × 5.8m (45.24m²). 93.0m² + 45.24m² = 138.24m²
12	2.54 + 1.27 = 3.81. The answer is C.

Percentages pp.22–23

1	30kg + 15% (4.5kg) = 34.5kg
2	15% of 3100 = 465 passengers
3	76% of 8400 = 6384 houses
4	86 out of 200 prefer tomato soup. $\frac{86}{200}$ is equal to $\frac{43}{100}$. The answer is 43%.
5	$\frac{14}{20}$ pens are still working. $\frac{14}{20}$ is equal to $\frac{70}{100}$. The answer is 70%.
6	$\frac{56}{80}$ is equal to 70%. $\frac{40}{80}$ is equal to 50%. 70% – 50% = 20%. The answer is D.
7	70 cows – 40% (28) = 42 cows. 42 cows + 28 cows = 70 cows
8	$\frac{60}{240}$ is equal to 25%.
9	192 + 12.5% = 216 members
10	A = 184, B = 195, C = 126, D = 128, E = 188. The largest value is 195. The answer is B.
11	Plot 1 is 12 acres. 50% of 12 acres = 6 acres. 12 acres + 6 acres = 18 acres. The answer is Plot 5.
12	$\frac{70}{80}$ is equal to 87.5%.

Extended answers
for Maths (Ages 9–10)

Ratio and proportion pp.24–25

1	First, find the amount needed for one cupcake. 120g ÷ 12 (10g). 10g × 20 cupcakes = 200g
2	If 3 out of every coffees is iced, then $\frac{5}{8}$ are hot. $\frac{5}{8}$ of 136 = 85 hot coffees
3	8:5 is equal to 64:40. The answer is 64 sheep.
4	25g to 75g is equal to 1:3.
5	25g to 400g is equal to 1:16.
6	First, find the cost of one meal (£22.45 ÷ 5). The cost per meal is £4.49. 2 × £4.49 = £8.98
7	9:2 is equal to 126:28. The answer is 28 children.
8	One bottle costs (£260.00 ÷ 4) £65.00. £65.00 × 9 = £585.00
9	The number of passengers is (248 + 67) 315. 315 ÷ 30 = 10.5. 10.5 × 2 = 21 cabin crew.
10	3:5 is equal to £2.70:£4.50. The answer is £2.70.
11	180 ÷ 24 = 7.5. 7.5 × 2 = 15. The answer is 15 staff.
12	First, calculate how much stock is needed for one person (1500ml ÷ 6) = 250ml. 9 × 250ml = 2,250ml

Probability pp.26–27

1	Add the total number of coins: 8 + 4 + 2 + 8 + 6 + 4 = 32 coins. There are eight 20p coins, so the probability of selecting a 20p coin is 8 in 32, simplified to 1 in 4.
2	There are eight letters in the name and E, A and I are vowels. The probability of the first card containing a vowel is equal to 3 in 8.
3	Add the total number of creatures: 22 + 12 + 8 (42). The probability of a frog jumping into the jar is equal to 22 in 42, simplified to 11 in 21.
4	There are eight numbers on the spinner, two of which are the number 2. The probability of the spinner landing on a 2 is equal to 2 in 8, simplified to 1 in 4.
5	Add the total number of pieces of fruit: 12 + 9 + 15 (36). The probability of selecting a red apple is equal to 12 in 36, simplified to 1 in 3.
6	The total number of felt tips is 7. The probability of selecting a blue felt tip is equal to 4 in 7.
7	The total number of raffle tickets sold is 255. Leila has 15 tickets. The probability that Leila will win a prize is equal to 15 in 255, simplified to 1 in 17.

Extended answers
for Maths (Ages 9–10)

Probability pp.26–27

8	Shirt numbers 2, 12, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 and 32 will have the digit 2 on them, a total of 13. The probability of Elliot's shirt having a number 2 on it is 13 in 40.
9	Add the total number of dogs: 5 + 3 + 4 + 2 (14). The probability a corgi will win the prize is equal to 2 in 14, simplified to 1 in 7.
10	Add the total number of rooms: 12 + 24 + 36 (72). The probability Jack will stay on the first floor is equal to 24 in 72, simplified to 1 in 3.
11	Add the total number of packets: 4 + 6 +6 (16). The probability the crisps are chicken flavour is equal to 4 in 16, simplified to 1 in 4.

Area and perimeter pp.28–29

1	The lawnmower has a cutting width of 40cm. The width of the lawn is 16 metres. If James cuts the lawn lengthwise, he must have to go up and down 1600cm ÷ 40cm. The answer is 40 times.
2	There are six surfaces on a box of tissues. The ends will equal (15cm × 10cm) × 2 (300cm ²). The front and back will equal (25cm × 10cm) × 2 (500cm²). The top and bottom surfaces will equal (25cm ×15cm) × 2 (750cm²). 300cm² + 500cm² + 750cm² = 1550 cm²
3	48 ×£90.00 = £4320.00
4	A regular nonagon has 9 sides of equal length. 9 × 6 = 54. The answer is B.
5	Separating the compound shape into two simple shapes, the top area will measure (4.5m × 2m) 9m². The bottom area will measure (7m × 4m) 28m². 9m² + 28m² = 37m²
6	Sally will need 6 tiles for the width (300cm ÷ 50cm) and 16 tiles for the length (800cm ÷ 50cm). 16 × 6 = 96 tiles
7	The perimeter of one of the flower beds is (8m + 1m) × 2 (18 metres)
8	The area of the garden covered in grass is equal to 10.5m × 3m (31.5m²) minus the total area of the flower beds (8m × 1m) × 2 (16m²). 31.5m² – 16m² = 15.5m²
9	26m × 9m (234 m²) – 36m² = 198m²
10	The perimeter is equal to: 26m + 9m + 9m + 6m + 6m + 6m + 11m + 9m. The perimeter is 82 metres.
11	The area of a triangle is base × height ÷2. 9mm × 3mm = 27mm². 27mm² ÷ 2 = 13.5mm²
12	The perimeter is made up of 6 units of width. Two units on each length and on unit on each width. Therefore the width of the pitch is: 300 ÷ 6 = 50 metres

Extended answers
for Maths (Ages 9–10)

Statistics pp.30–31

1	21°C + 24°C + 19°C + 22°C = 86°C. 86 ÷ 4 = 21.5°C
2	The range is the difference between the largest and the smallest amount. The largest amount is £442.83; the smallest amount is £147.98. £442.83 – £147.98 = £294.85
3	Size 2 = 4, size 6 = 1, size 3 = 3, size 4 = 2, size 1 = 2. Therefore, the mode is size 2.
4	The range is the difference between the largest and the smallest amount. The shortest height is 128 cm; the tallest must equal 128cm + 17cm. The answer is 145cm.
5	If the average (mean) score is 30, then the total scores must equal 30 × 4 (120). Scores so far equal (27 + 35 + 38) 100. Therefore, Adrian's score in his fourth test must equal 120 – 100 (20). The answer is 20.
6	30kg + 24kg + 18kg + 21kg + 27kg = 120kg. 120kg ÷ 5 = 24kg
7	If the average (mean) is 7, then the total cups must equal 7 × 7 (49). The total cups consumed from Monday to Saturday equals (9 + 6 + 5 + 7 + 8 + 6) 41 cups. 49 cups – 41 cups = 8 cups
8	348 students ÷ 12 = 29 students
9	Speed = distance ÷ time. 288 ÷ 6 = 48mph
10	For July, the average (mean) temperature is (22°C + 40°C + 22°C + 28°C) 112°C ÷ 4 = 28°C.
11	For January, the range is the difference between 14°C and –10°C. The answer is 24°C.

Measurement pp.32–33

1	2.45m is equal to 245cm. 1.89m is equal to 189cm. 245cm – 189cm = 56cm
2	250ml + 275ml + 800ml = 1325ml. 1325ml is equal to 1.325 litres.
3	The daily amount of sugar used is 10g × 8 (80g). The weekly amount is 80g × 7 (560g). 560g is equal to 0.56kg.
4	3.38 metres is equal to 3380mm. 3380mm – 148mm = 3232mm
5	$6\frac{3}{4}$kg is equal to 6750g. 5.25kg is equal to 5250g. 6750g – 5250g = 1500g
6	80% of 3.6 litres is 2.88 litres. Converting to millilitres: 3600ml – 2880ml = 720ml
7	0.75 litres is equal to 750ml. 750ml + 300ml = 1050ml
8	5.8 metres + (6 × 30cm) 180cm is equal to 580cm + 180cm = 7.6 metres.
9	5 litres is equal to 5000ml. 5000ml ÷ 20 = 250ml
10	0.38km + 18.5km + 0.47km = 19.35km. The answer is C.
11	24 metres is equal to 2400cm.
12	16 × 1.6 = 25.6km. The answer is E.

Extended answers
for Maths (Ages 9–10)

Speed, distance and time pp.34–35

1	Distance = speed × time. 800 × 11.5 = 9200km
2	Speed = distance ÷ time. 8 miles in 40 minutes is equal to 4 miles in 20 minutes. 4 miles × 3 (there are three lots of 20 minutes in 1 hour) = 12mph
3	Speed = distance ÷ time. 20 minutes is equal to one-third of an hour. 6 × 3 = 18mph
4	Distance = speed × time. 62 × 3.5 = 217 miles
5	Speed = distance ÷ time. 450km in 90 minutes is equal to 900km in 3 hours. 900km ÷ 3 = 300km/h.
6	Speed = distance ÷ time. The total journey is (70 minutes + 20 minutes) 90 minutes. The total distance is (12 miles + 3 miles) 15 miles. The total distance for 30 minutes (15 ÷ 3) = 5 miles. Therefore, the average speed for the journey is 5 × 2 = 10mph.
7	Time = distance ÷ speed. 96 ÷ 16 = 6 minutes
8	Distance = speed × time. 480 × 8.5 = 4,080. Answer equals 4,080 miles.
9	Speed = distance ÷ time. 24 miles in 40 minutes is equal to 12 miles in 20 minutes. 12 miles × 3 (there are three lots of 20 minutes in 1 hour) = 36mph
10	Distance = speed × time. 7 × 50 = 350 miles
11	Time = distance ÷ speed. The total number of miles from Bath to York is 248. Then add 67 miles from York to Bury (248 + 67). The total number of miles for the journey is 315. 315 ÷ 45 = 7 hours
12	Time = distance ÷ speed. 1.5 ÷ 3 = 0.5. 0.5 of an hour is equal to 30 minutes.

Geometry 1 pp.36–37

1	Each five-minute section on an analogue clock is 30° (360° ÷ 12). 10 minutes = 60°
2	Angles in a quadrilateral = 360°. 360° – (123° + 115° + 65°) 303° = 57°
3	Pentagons have five sides. Five-sided shapes have 540°.
4	Shape A contains four right angles. Shape C contains one right angle plus two acute angles. Shape D contains two obtuse angles and two acute angles. Shape B contains two right angles, one acute angle and two obtuse angles. The answer is shape B.
5	36cm × 6 = 216cm²
6	A shape's order of rotational symmetry is defined by the number of times in a full turn (360°) that the shape can fit exactly on to itself. An equilateral triangle may be rotated three times with symmetry. The answer is A.

Extended answers
for Maths (Ages 9–10)

Geometry 1 pp.36–37

7	Angles in a full turn = 360°. 360° – (75° + 123° + 111°) 309°= 51°
8	Each five-minute section on an analogue clock is 30°, so 4 × 30° sections make 120°. If the small hand is pointing to 3, the time must be 5 minutes to 3 o'clock.
9	There are eight squares, each containing four right angles. 8 × 4 = 32 right angles
10	Shape D illustrates the shape after a 180° rotation.
11	A pentagonal prism has seven faces; a triangular prism has five faces. The difference is two. The answer is E.

Geometry 2 pp.38–39

1	The net is of a triangular prism. The answer is C.
2	The regular heptagon has seven lines of symmetry. The square has four lines of symmetry. The isosceles triangle has one line of symmetry. The right-angled triangle has no lines of symmetry. The ellipse has two lines of symmetry.
3	The interior angles of a hexagon add up to 720°. 120° + 140° + 110° + 115° + 105° = 590° 720° – 590° = 130°
4	Angles on a straight line add up to 180°. 180° – 114° = 66°
5	Angles in a triangle add up to 180°. We know from question 4 that angle x = 66°. 180° – (66° + 79°) 145 = 35°
6	There are only five squares in B, and a cube has six sides. Therefore, B cannot be formed into a cube.
7	The shape has been rotated through 135° clockwise.
8	Shapes A and E are perpendicular as the lines are at right angles to each other.
9	The interior angles of a pentagon add up to 540°. 540° – (98° + 116° + 110° + 115°) 439 = 101°
10	3 × 3 × 3 = 27 cubes

Extended answers
for Maths (Ages 9–10)

Data handling 1 pp.40–41

1	Train 1 = 1 hour 50 minutes. Train 2 = 1 hour 42 minutes. Train 3 = 1 hour 52 minutes. Train 4 = 1 hour 59 minutes. Therefore, Train 2 is the quickest.
2	14 + 5 + 3 + 7 +27 + 8 + 22 = 86 children
3	22 + 7 + 3 + 8 = 40 children
4	14 + 5 + 3 + 7 =29 children
5	5 + 3 + 7 + 8 = 23 children
6	27 – 14 = 13 children
7	15% of 60 = 9 families
8	20% of 60 = 12 families
9	30% of 60 = 18 families (prefer France). 25% of 60 = 15 families (prefer Spain). 18 – 15 = 3 families
10	10% of 60 = 6 families (choose Italy). 20% of 60 = 12 families (choose Australia). 12 – 6 = 6 families
11	23° – 15° = 8°C
12	22° – 12° = 10°C

Data handling 2 pp.42–43

1	Alexa answered 36 questions correctly.
2	Tharun answered 35 questions correctly for science. Trisha answered 32 questions correctly for maths. 35 – 32 = 3 questions
3	Simon answered 42 questions correctly for English. Therefore, he must have answered 8 questions incorrectly as the test was out of 50.
4	Alexa answered 30 questions correctly for science and 43 correctly for maths. Therefore, she answered 13 more maths questions correctly.
5	Anushka improved by 8cm. Barack improved by 16cm. Caitlin improved by 11cm. Daniel improved by 12cm. Erik improved by 8cm. Therefore, Barack made the most improvement with 16cm.
6	Anushka improved by 1 second. Barack improved by 1.9 seconds. Caitlin improved by 0.8 seconds. Daniel improved by 4.2 seconds. Erik improved by 1.8 seconds. Therefore, Daniel made the most improvement with 4.2 seconds.
7	Maryam parks for 50 minutes which is less than 1 hour. She pays £2.70.
8	08:30 to 12:40 is 4 hours 10 minutes. Silas has to pay for 4–6 hours, which is £16.20.

Extended answers
for Maths (Ages 9–10)

Data handling 2 pp.42–43

9	16:05 to 19:40 is 3 hours 35 minutes, which would be £10.80. Sunday is £7.50 all day. £10.80 – £7.50 = £3.30
10	York earned 36 house points in Term 3 and 26 house points in Term 1. 36 – 26 = 10 house points
11	Richmond earned 48 house points in Term 2 and Beaufort earned 30 house points in Term 2. 48 – 30 = 18 house points
12	Gloucester earned 16 house points in Term 1 and York earned 36 in Term 3. 36 – 16 = 20 house points

Data handling 3 pp.44–45

1	Team 3 scored (8 × 6) goals, which is 48 goals.
2	Team 4 scored (10 × 6) goals (60). Team 6 scored (6 × 6) goals (36). 60 – 36 = 24 goals
3	Team 5 scored (9 × 6) goals (54). Team 1 scored (11 × 6) goals (66). 66 – 54 = 12 goals
4	There are 48 footballs, all representing 6 goals. 48 × 6 = 288 goals
5	Team 2 scored (4 × 6) goals (24). 24 × 2 = 48 goals
6	Team 3 scored (8 × 6) goals (48). Team 4 scored (10 × 6) goals (60). 48 + 60 = 108 goals
7	Russell, Amina and Leila have blue eyes and brown hair. The answer is 3 children.
8	There are six children in the table and three of them have a shoe size of 3 or smaller. 3 from 6 is equal to 50%.
9	Leon is the tallest at 144cm and Leila is the shortest at 137cm. The range is the difference between the largest and the smallest. 144cm – 137cm = 7cm
10	Amina, Leon and Leila wear glasses, which is $\frac{3}{6}$. $\frac{3}{6}$ is equal to $\frac{1}{2}$.
11	Geona and Leila are less than 140cm tall. $\frac{2}{6}$ is equal to $\frac{1}{3}$.
12	The children's heights add up to 846cm. 846 ÷ 6 = 141cm

Coordinates pp.46–47

1	The coordinates of A are (8,4) and the coordinates of B are (3,7).
2	The coordinates of Y are (4,3) and the coordinates of Z are (–3,–1).
3	The coordinates of the shape are (6,2), (12,7), (11,12), (2,8), (5,6). The answer is E.

Extended answers
for Maths (Ages 9–10)

Coordinates pp.46–47

4	The new coordinates of point M will be (2,3).
5	The coordinates of point P will be (8,5) when reflected first in mirror line B and then in mirror line A.
6	The coordinates of point D will be (8,5) when translated three points down, one point the right and then reflected in mirror line A.
7	When the rectangle is complete, the coordinates of the centre of the shape will be (1,–1)
8	The coordinates of the otters are (10, 12) and the coordinates of the meerkats are (2,4). Therefore, the coordinates of the halfway point will be (6,8).

Algebra pp.48–49

1	Strawberry cheesecakes = x, chocolate brownies = $x + 25$ $2x + x + 25 = £4.75$ $3x = £4.75 – 25 (£4.50)$ $x = £1.50$. The strawberry cheesecakes each cost £1.50.
2	Zain = x, Sammi = $x + 3$, Gigi = $x – 2$ $x + x + 3 + x – 2 = 22$ $3x = 22 – 1$ $x = 7$. Zain is 7 years old.
3	$2x + 14y$. The answer is D.
4	$2x + 24 = 36$ $2x = 36 – 24$ $2x = 12$ $x = 6$
5	Rugby = x, dinosaurs = $2x$, maps = $3x$ $6x = £24.00$ $x = £4.00$. The book on maps cost (£4.00 × 3) £12.00.
6	$6a = 180°$ $a = 30°$
7	Raspberries = x, strawberries = $3x$, cherries = $6x$ $10x = 40$ $x = 4$. Cherries = (4 × 6) 24 acres
8	If the three boxes weigh 1.8kg, the milk chocolates must weigh 900g. If the white chocolates weigh 450g, the dark chocolate box must also weigh 450g.
9	$7 + 9 – 8 + 12 + 4 = 24$

Extended answers
for Maths (Ages 9–10)

Algebra pp.48–49

10	The tiger cub weighs $x$kg, the tiger weighs $60x$. $61x$ = 122kg. x = 2kg. The tiger cub weighs 2kg.
11	$2x + x + 2x + x$ = 36cm $6x$ = 36cm x = 6cm
12	$5a - 3a = 13 + 19$ $2a = 32$ $a = 16$

Mixed test 1 pp.50–51

1	4 hours 10 minutes = 250 minutes 80% of 250 = 200 minutes 200 minutes = 3 hours 20 minutes
2	It is more efficient to estimate the weight of one cat and then build the other weights around the first cat. For example, imagine Rupert weighs 3000g; Raffles would weigh (3000g – 80g) 2920g. Ringo would weigh (2920g + 140g) 3060g. Ridley would weigh (3000g – 60g) 2940g. The range is the difference between 3060g and 2920g, which is 140g.
3	4500 ÷ 100 = 45. The answer is £45.00.
4	If Rahul is 156cm tall, Saif is (156cm – 12cm) 144cm tall. Zain is (144cm + 4cm) 148cm.
5	Sophie has read (216 ÷ 2) 108 pages before dinner. 108 + 23 = 131. Sophie has (216 – 131) 85 pages left to read.
6	Lux spends £2.40. Kailash spends (£2.40 ÷ 2) £1.20. Maheeshah spends (£1.20 – 25%), which is 90p. Lathi spends 90p – 10p, which is 80p.
7	424 – 42 = 382. 382 tins rounded to the nearest 10 is 380 tins.
8	528 ÷ 22 = 24. Children may find it easier to calculate 528 ÷ 11 (48) then 48 ÷ 2, which is 24.
9	£4.50 + £10.50 (£15.00) + 15% service charge (£2.25) = £17.25
10	(£3.00 × 2) £6.00 + £8.00 (£14.00) +15% service charge (£2.10) = £16.10
11	(£4.00 × 4) £16.00 + £8.00 + £13.00 + (£9.50 × 2) £19.00 (£56.00) + 15% service charge (£8.40) = £64.40)
12	There are two possible answers. 2^2 (4) + 9^2 (81) = 85 6^2 (36) + 7^2 (49) = 85

Extended answers
for Maths (Ages 9–10)

Mixed test 2 pp.52–53

1	20% of £120.00 = £24.00. £120.00 – £24.00 = £96.00. $\frac{1}{8}$ of £96.00 = £12.00. £120.00 – (£24.00 + £12.00) = £84.00
2	12 years and 4 months = 148 months. 3 years and 6 months = 42 months. 148 months – 42 months = 106 months. 106 ÷ 12 = 8 remainder 10. Lena is 8 years 10 months old.
3	£12.60 – (the difference) £1.80 = £10.80. £10.80 ÷ 2 = £5.40. Add the difference back on to this amount to find the larger amount. £5.40 + £1.80 = £7.20
4	900 litres ÷ 15 = 60 minutes
5	4.23 metres = 423cm. 3.45 metres = 345cm. 423cm – 345cm = 78 cm. The answer is B.
6	40 minutes is equivalent to $\frac{2}{3}$ of 1 hour. 90 × $\frac{2}{3}$ = 60km
7	3363 + 812 + 354 + 272 + 71 = 4872. 4872 ÷ 812 = 6. The answer is C.
8	240 × 15% = 36 meals
9	Area = length × width. 7m × 2.5m = 17.5 m²
10	3.6km is equal to 3600 metres. 3600 ÷ 4.5 = 800 metres
11	1 week = 7 days. 210 ÷ 7 = 30 weeks

Mixed test 3 pp.54–55

1	Distance = speed × time. 56 × 1.5 = 84 miles
2	94 bedrooms × 2 windows (188) + 24 = 212 windows. 212 × £2.50 = £530.00
3	15:30 + 50 minutes + 20 minutes + 40 minutes = 17:20
4	$\frac{1}{3}$ + $\frac{1}{4}$ equals $\frac{7}{12}$. The remaining pizza is $\frac{5}{12}$.
5	Aiden + 9 guests = 10 people. The recipe states 32 king prawns for four people, which equals eight king prawns per person. The recipe for 10 people would be 8 × 10 = 80 king prawns.
6	Kieran is 17 years – 9 (8). Sienna is 21 years –9 (12). The answer is 12 years old.
7	The interior angles add up to 540°. 112° + 114° + 111° + 118° = 455°. 540° – 455° = 85°
8	Tymon answers 15% of the questions incorrectly. 15% of 80 = 12 questions
9	The number of weekly dishwasher cycles is 5 + 2 + 2 (9). 48 litres × 9 = 432 litres
10	42 millimetres is equal to 4.2cm. 27.2cm + 4.2cm = 31.4cm

Extended answers
for Maths (Ages 9–10)

Mixed test 3 pp.54–55

11	49.2cm + 68.8cm + 98.6cm + 79.3cm = 295.9cm
12	Jamie must deliver $\frac{1}{3}$ of his post between 09:00 and 11:00. $\frac{1}{3}$ of 252 = 84 houses

Mixed test 4 pp.56–57

1	39 minutes + 30 minutes + 43 minutes + 33 minutes + 60 minutes = 205 minutes. 205 ÷ 5 = 41 minutes. The answer is A.
2	The range is the difference between the largest amount and the smallest amount. 28.3 degrees – 12.2 degrees = 16.1 degrees
3	20% of 480,000 = 96,000. 480,000 – 96,000 = 384,000 people
4	The ends equal (1.5cm × 3cm = 4.5cm) × 2 (9cm²) The sides equal (7cm × 3cm = 21cm) × 2 (42cm²) The top and bottom equal (7cm × 1.5cm = 10.5cm) × 2 (21cm²) 9cm² + 42cm² + 21cm² = 72cm²
5	Use algebra: Henry = x, Charlie = x + 2, Louis = x + 5. 3x + 7 = 34 3x = 34 – 7 3x = 27 x = 9 Henry is 9 years old, Louis is 14 years old, Charlie is 11 years old.
6	A day is 24 hours. $\frac{9}{24}$ is equal to $\frac{3}{8}$.
7	The call out charge is £60.00. The hourly charge will be ¾ of £40.00 (£30.00). £60.00 + £30.00 = £90.00
8	The movie will finish at (15:20 + 40 minutes) 16:00. 16:00 – 1 hour 45 minutes = 14:15
9	The range is the difference between the largest amount and the smallest amount. The youngest age is 5 years, therefore the oldest must be 5 years plus 38 years which is 43 years old.
10	1.2 miles in 12 minutes is equal to (1.2 × 5) 6 mph.
11	72 – 14 = 58. 58 ÷ 2 = 29. There will be 29 girls and (29 + 14) boys. There are 43 boys.
12	The fourth coordinate will begin with a 6. The only option is (6,5). The answer is B.

Extended answers
for Maths (Ages 9–10)

Mixed test 5 pp.58–59

1	If $\frac{3}{4}$ of the seats are unoccupied, this means that $\frac{1}{4}$ must be occupied. $\frac{1}{4}$ of 60 = 15 passengers
2	£20.00 + £15.00 + £1.00 + 50p + 50p + 10p = £37.10 £39.99 – £37.10 = £2.89. The answer is F.
3	24 × 12 = 288. If $\frac{7}{8}$ are eaten, $\frac{1}{8}$ must remain uneaten. $\frac{1}{8}$ of 288 = 36 sausage rolls
4	08:30 to 12:30 = 4 hours. 13:15 to 17:30 = 4.25 hours. 4 hours + 4.25 hours = 8.25 hours. The answer is 8 hours 15 minutes.
5	12.8kg – 3.4kg = 9.4kg. 9.4kg ÷ 2 = 4.7kg, which is the weight of the smaller parcel. Therefore, the heavier parcel must weigh 4.7kg + 3.4kg (8.1kg).
6	If the mean (average) is £8.40, then the total amount must be £8.40 × 3 (£25.20). £10.50 + £6.50 = £17.00 £25.20 – £17.00 = £8.20
7	Count the number of 3.5cm sides in the entire shape. There are 10. 10 × 3.5cm = 35cm.
8	A = 60, B = 60, C = 81, D = 69, E = 64. The calculation with the larges value is 13.5 × 6 (81). The answer is D.
9	4.2kg – 1.2kg = 3.0kg. 3.0kg is equal to 3000g. 3000g ÷ 12 = 250g
10	Crimson, ruby and scarlet are shades of red. Blue and cyan are shades of blue. The ratio of red to blue shades is 3:2.
11	17:43 – 14:05 = 3 hours 38 minutes
12	£2.00 + £1.00 + 20p = £3.20. Therefore, Luna must have spent £10.00 – £3.20 (£6.80). £6.80 ÷ 8 = 85p

Mixed Test 6 pp.60–61

1	If it takes 5 litres to mark 100 spaces, 5 litres ÷ 0.5 litres will mark out 10 parking spaces.
2	266 ÷ 38 = 7. If there are two crew members for every 38 passengers, there will be 7 × 2 = 14 crew members.
3	2.8°C – 7°C = –4.2°C. The answer is D.
4	15:00 + 45 minutes = 15:45 15:45 + 15 minutes = 16:00 16:00 + 45 minutes = 16:45 1 6:45 + 7 minutes = 16:52
5	70% of 60 = 42 questions
6	If a square has a perimeter of 52cm, its sides will each measure 13cm. 13cm × 13cm = 169cm²

Extended answers
for Maths (Ages 9–10)

Mixed Test 6 pp.60–61

7	The train resumed its journey at 12:15 and completed the journey at 13:30. Time taken = 75 minutes Distance covered = 60 miles Speed = distance ÷ by time 60 ÷ 75 = 0.8 0.8 of 60 = 48 48mph
8	Ratio of adults to children = 1:3. There are 50 adults to 150 children. The answer is 50 adults.
9	5 minutes + 21 minutes + 11 minutes + 13 minutes + 16 minutes = 66 minutes
10	Distance from Ely to Bath = 160 miles. Speed = distance ÷ time 160 ÷ 2.5 = 64mph