

# Extended answers

## for 11+ Mathematics Test Papers

### Test 1 p.5

1	C	The difference between $17.4^{\circ}\text{C}$ and minus $2.4^{\circ}\text{C}$ equals $(17.4 + 2.4) 19.8^{\circ}\text{C}$ .
2	19:10	$17:45 + 1 \text{ hour and } 25 \text{ minutes} = 19:10$
3	$1.62\text{m}^2$	The shorter sides equal $x$ and the longer sides equal $2x$ . The perimeter must equal $6x$ $5.4 \div 6 = 0.9$ metres. Therefore, the table must have sides measuring 1.8 metres and 0.9 metres. $1.8 \times 0.9 = 1.62\text{m}^2$
4	9h 30mins	The distance from Pisa to Milan = 279 kilometres and the distance from Milan to Rome = 576 kilometres. The total journey is 855km. $855 \div 90 = 9.5$ , which equals 9 hours 30 minutes.
5	E	$168.72 \div 6 = 28.12$ litres
6	£310,800	$23\% + 35\% = 58\%$ . Therefore, Martha must keep 42% of £740,000. $42\% \text{ of } £740,000 = £310,800$
7	14 rows	$300 \div 22 = 13.63$ . Therefore, 14 rows of chairs will be needed.
8	E	$£600 \div 24 = £25$
9	186 strawberries	$248 \div 4 = 62$ $248 - 62 = 186$
10	5392 children	$8439 + 7412 = 15,851$ $21,243 - 15,851 = 5392$
11	12cm	There are $12 \times 1\text{cm}$ triangles in the shape.
12	126	$81 + 171 = 252$ $252 \div \text{by } 2 = 126$
13	£86	Total distance covered = $400\text{m} + 10,000\text{m} + 2500\text{m}$ (12,900km) $12,900 \div 300 = 43$ $£2 \times 43 = £86$
14	3 in 8	Saskia has a total of $4 + 2 + 9 + 10 + 15$ coins (40). She has fifteen 5p coins. Therefore, Saskia has a 15 in 40 chance of selecting a 5p coin. Simplified, this is 3 in 8
15	£17.56	$£39.95 + £22.50 + £19.99 = £82.44$ $£100 - £82.44 = £17.56$
16	90 litres	If two-thirds equals 120, then one-third equals 60. Therefore, the bath must hold a total of $60 \times 3$ (180 litres). Half full, the bath must hold 90 litres.
17	A	If seven doughnuts cost £12.95, then one doughnut must cost £1.85 Four doughnuts would cost $£1.85 \times 4$ (£7.40).

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18	Trisha	Imagine that Zoya is 150cm tall. Then Neil would be (150cm – 8cm) 142cm. Daniel would be (142cm + 9cm) 151cm. Trisha would be (151cm + 3cm) 154cm. Anvi would be (154cm – 12cm) 1442cm. Therefore, Trisha would be the tallest.
19	31°	Angles on a straight line add up to 180°. $38^\circ + 61^\circ + 50^\circ = 149^\circ$ $180^\circ - 149^\circ = 31^\circ$
20	49 marks	If the average/mean score was 59, then the total score would have been (59 × 6) 354 The first five add up to (64 + 59 + 72 + 62 + 48) 305 $354 - 305 = 49$ marks
21	£240	£480 in the ratio 4:3:1 is £240:£180:£60. Therefore, the largest amount will be £240
22	(8,3)	If point A were to be reflected in mirror line A, it would be at the coordinate (8,3).
23	6000	If 2160 is multiplied by 100, the result is 216,000. Therefore, the 6 would have the value of 6000
24	A	15% of £75 = £11.25. $£75 + £11.25 = £86.25$
25	1 in 6	The total number of sausages = (6 + 4 + 8 + 6) 24 There are four pork and leek sausages. Therefore, the probability would be 4 in 24. Simplified, this is 1 in 6
26	7.36	$3.2 \times 2.3 = 7.36$
27	48 children	There 360° in a circle. $360 \div 120$ (children) = 3. Therefore, each child is represented by 3°. $144 \div 3 = 48$ children
28	48.6cm	A regular nonagon has nine sides of equal length. $5.4\text{cm} \times 9 = 48.6\text{cm}$ .
29	43 tables	$348 - 12 = 336$ . $336 \div 8 = 42$ . Therefore, there are 42 tables with eight people and one table with 12 people, so 43 tables in total.
30	4 coins	The least number would be 4 coins (£2 + 20p + 5p + 2p).
31	13 hours	The flight would have taken off at 02:30 London time. 02:30 until 15:30 = 13 hours.
32	74mph	The train journey takes 5 hours and 30 minutes (5.5 hours). $407 \div 5.5 = 74\text{mph}$
33	750g	For one person, $300\text{g} \div 4$ would be needed (75g). For ten people, this would be (10 × 75g) 750g.
34	355 women	3:5 is equal to 213:355

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35	20 chocolates	One-quarter of 48 = 12. One-third of 48 = 16 $12 + 16 = 28$ . $48 - 28 = 20$
36	8.4	The points on the number line increase by 0.1 each time. Therefore, the arrow is pointing to 8.4
37	14.4g	$6 \times 2.4 = 14.4\text{g}$
38	17.5cm <sup>2</sup>	The area of a triangle = height multiplied by base, divided by 2 $5\text{cm} \times 7\text{cm} = 35\text{cm}$ . $35 \div 2 = 17.5\text{cm}^2$
39	E	$20\text{p} \times 7 = \text{£}1.40$ . $\text{£}1.40 \times 12 = \text{£}16.80$
40	279g	The median is the number left in the middle once the numbers have been arranged in order. In this question, 276g and 282g are the middle numbers. $(276 + 282) \div 2 = 279\text{g}$
41	180	$26 \times 6 = 156$ . $32 - 26 = 6$ . $6 \times 4 = 24$ $156 + 24 = 180$ passengers
42	B	07:25 till 10:12 = $35 + 60 + 60 + 12$ (167 minutes) or 2 hours and 47 minutes
43	40 metres	Two minutes = 120 seconds. $120 \div 12 = 10$ $10 \times 4 = 40$ metres
44	£40	$\text{£}4.49 + \text{£}6.99 + \text{£}12.29 + \text{£}15.99 = \text{£}39.76$ Rounded to the nearest pound = £40
45	D	Total sales = $210 + 187 + 310 + 223$ (930)

### Test 2 p.13

1	C	The smallest number would be 12,349 12,349 rounded to the 10 is 12,350
2	£8.10	$\frac{1}{5} + \frac{1}{3} = \frac{8}{15}$ This means that $\text{£}3.78 = \frac{7}{15}$ Therefore, $\frac{1}{15} = \text{£}3.78 \div 7$ (49p) $15 \times 54\text{p} = \text{£}8.10$
3	14 blue felt-tips	Pink = $x$ , blue = $2x$ , green = $4x$ $7x = 49$ , therefore $x = 7$ Blue felt-tips = 14
4	3 hrs 24 mins	The 04:12 train takes 206 minutes. The 07:05 train takes 210 minutes. The 10:18 train takes 204 minutes. The 13:08 train takes 218 minutes. Therefore, the fastest train takes 3 hours 24 minutes.

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5	E	$\frac{3}{8}$ is equal to 37.5%
6	7 in 16	The total number of bulbs = $(15 + 16 + 20 + 12 + 17)$ 80 The number of pink and orange bulbs = $(15 + 20)$ 35 The probability that the first tulip to bloom will be either pink or orange equals 35 in 80, simplified to 7 in 16
7	6mph	Asher would walk 2 miles every 20 minutes, which equals 6mph.
8	D	The prime numbers between 1 and 10 are 2, 3, 5 and 7 $2 \times 3 \times 5 \times 7 = 210$
9	£810	Area = length $\times$ width. $6 \times 4.5 = 27\text{m}^2$ $\text{£}30 \times 27 = \text{£}810$
10	160km	1 centimetre would represent 16 kilometres. Therefore, 10 centimetres would represent 160km.
11	Village Hall	The Post Office is at (1,2) and the barn is at (9,10). Halfway is (5,6), which is the Village Hall.
12	£15	0.5 is equal to $\frac{1}{2}$ . The sum of money must therefore equal $\text{£}37.50 \times 2$ (£75). 0.2 is equal to $\frac{1}{5}$ $\text{£}75 \times \frac{1}{5} = \text{£}15$
13	120°	The internal angles in a regular hexagon total 720 degrees. $720 \div 6 = 120^\circ$
14	19 points	If the first nine games resulted in an average/mean score of 18 points, the total number of points must have been $18 \times 9$ (162). The points after the tenth game must have been $162 + 28$ (190). New average/mean = $190 \div 10$ (19 points)
15	£11.70	$\text{£}17.55 \div 9 = \text{£}1.95$ $\text{£}1.95 \times 6 = \text{£}11.70$
16	£29.50	Children's tickets cost £5.90 (50% of £11.80) $\text{£}11.80 + \text{£}5.90 + \text{£}5.90 + \text{£}5.90 = \text{£}29.50$
17	C	The heights arranged in order are 136cm, 138cm, 140cm, 141cm, 142cm, 144cm, 144cm, 148cm, 150cm, 150cm, 151cm and 152cm. The two numbers in the middle are 144cm. Therefore, the median height would be 144cm.
18	17 dishes	Tarun bought four more dishes than Tiffany; a difference of £6. Therefore, each dish must have cost £1.50. Arjun ordered 2 dishes, Tiffany 1, Agata 3, Tarun 5 and Olivia 6. $2 + 1 + 3 + 5 + 6 = 17$ dishes
19	0.63	$5.67 \div 9 = 0.63$

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20	63 tiles	Arun will need 9 tiles for the length ( $4.5 \times 0.5$ ) and 7 tiles for the width ( $3.5 \times 2$ ). $9 \times 7 = 63$ tiles
21	70%	Mabel scores 48 out of 60 = 80% in her maths paper, 54 out of 72 = 75% for her English paper and 55 out of 100 = 55% for her science paper. $(80 + 72 + 55) \div 3 = 70\%$
22	£2.12	$£3.20 \times 2 = £6.40$ . $4 \times 37p = £1.48$ $£10 - (£6.40 + £1.48) = £2.12$
23	1.5kg	1 cupcake will weigh $900 \div 12$ (75g). $75g \times 20 = 1,500g$ or 1.5kg
24	B	The probability of throwing a six with one dice = 1 in 6 The probability of throwing two sixes with two dice is $6 \times 6$ 1 in 36
25	£2.40	Mrs Edge is away from her car for 1 hour and 45 minutes. Therefore, she should pay for up to 2 hours, which is £2.40
26	47 minutes	Anya's £2.40 would pay for parking until 16:35 15:48 to 16:35 is 47 minutes
27	279 miles	$62 \times 5.4 = 279$ miles
28	2	The mode is the most frequent value, which is 2
29	south-west	From north, 270 degrees clockwise would equal west. From west, 90 degrees anticlockwise would equal south. From south, 45 degrees clockwise would equal south-west.
30	10 children	The number of children playing two or more instruments = $2 + 1 + 4 + 3$ , which is 10 children.
31	$\frac{1}{5}$	12 out of 60 minutes = $\frac{1}{5}$ .
32	£160	Milo receives $x$ , Emma receives $3x$ $4x = £640$ . Therefore, $x = £640 \div 4$ (£160).
33	32 tigers	$112 \div 7 = 16$ . $16 \times 2 = 32$ tigers
34	$x = 7$	$6x - 4 = 4x + 10$ $6x - 4x = 4 + 10$ $2x = 14$ $x = 14 \div 2$ $x = 7$
35	£15.03	$£4 + £3 + £2.50 + £2.40 + £2 + 75p + 24p + 7p = £14.96$ $£29.99 - £14.96 = £15.03$

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36	150 metres	$14.1\text{m} \times 10 = 141$ metres; $1 \text{ metre} \times 9 = 9$ metres $141 + 9 = 150$ metres
37	Friday	1 June will fall on a Tuesday. Therefore, 8 June will also fall on a Tuesday. 9 June will fall on a Wednesday, 10 June will fall on a Thursday and 11 June will fall on a Friday.
38	46.5cm	The missing measurement will be $11.6\text{cm} - (2.8\text{cm} + 4.5\text{cm}) = 4.3\text{cm}$ . $2.8 + 5.0 + 4.5 + 4.3 + 4.3 + 6.0 + 11.6 + 8.0 = 46.5\text{cm}$
39	E	$20\text{kg} = 20,000$ grams. $20,000 \div 400 = 50$ days
40	2cm	The area of a right-angled triangle = base $\times$ height $\div 2$ If the area = $5\text{cm}^2$ , the height must equal 2cm.
41	320	The sum of 7 and 13 = 20 $20 \times 16 = 320$
42	A	$160 \div 32 = 5$
43	14 cars	38 black cars and 24 white cars were sold in August. $38 - 24 = 14$
44	8 cars	32 grey cars and 24 white minis sold in August. $32 - 24 = 8$
45	122 cars	Black = 38, grey = 32, white = 24, blue 28. The total number sold in August is 122 cars.

### Test 3 p.21

1	B	The lowest common multiple of 14 and 9 equals 126cm.
2	0.625	$\frac{5}{8}$ as a decimal = 0.625
3	488 passengers	$34 + 12 + 8$ (54 passengers leaving the train) $54 + 42 + 59$ (155 passengers joining the train) $155 - 54 = 101$ $387 + 101 = 488$ passengers
4	2:3	There are 6 footballs and 9 rugby balls. The ratio is 6:9. When simplified, this equals 2:3
5	E	The median is the number left in the middle once the numbers have been arranged in order. In this question, 17 and 18 remain. $(17 + 18) \div 2 = 17.5$
6	4125 miles	8 hours and 15 minutes = 8.25 hours $500 \times 8.25 = 4125$ miles
7	35km	Seb is doubling the extra distance in training each week.

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8	C	$4.5 \times 4.5 = 20.25$
9	£40	Children's tickets are 25% less than £16 (£12). $£16 + £12 + £12 = £40$
10	16:15	$11:38 + 3 \text{ hours and } 57 \text{ minutes} = 15:35$ $15:35 + 40 \text{ minutes} = 16:15$
11	1 in 7	There are $(15 + 8 + 4 + 1)$ 28 items and 4 fidget spinners. The probability of hooking a fidget spinner is 4 in 28. When simplified, this equals 1 in 7
12	30p	The cans in the pack of eight cost $(£4.80 \div 8)$ 60p $90\text{p} - 60\text{p} = 30\text{p}$
13	48	$20\%$ of 240 = 48 $2.5 \times 20 = 50$ 114 minus 82 = 32 $25\%$ of 120 = 30 $\frac{2}{3}$ of 120 = 80 $(48 + 50 + 32 + 30 + 80) \div 5 = 48$
14	23 days	After 22 days, Arya will have walked 154 miles, so it would take 23 days to cover 160 miles.
15	2250 litres	One-quarter of 3000 = 750. Therefore, an extra 2250 litres will be required to fill the tank.
16	25.76kg	$22.4\text{kg} \times 15\% = 3.36\text{kg}$ $22.4\text{kg} + 3.36\text{kg} = 25.76\text{kg}$
17	D	$x^2 = 49$ . $4x = 28$ $49 + 28 = 77$
18	240 degrees	A reflex angle is greater than 180 degrees but less than 360 degrees. Angles in a circle add up to 360 degrees. Each 5 minutes on a clock face = 30 degrees. $30 \text{ degrees} \times 8 = 240 \text{ degrees}$
19	6 boxes	Joshua will need $600\text{cm} \div 75$ for the length (8 tiles) and $300\text{cm} \div 75\text{cm}$ for the width (4 tiles). $8 \times 4 = 32$ tiles needed Joshua will need to buy 6 boxes, which will give him 36 tiles.
20	8 students	September birthdays equal $(4 \times 6)$ 24, February birthdays equal $(4 \times 4)$ 16 $24 - 16 = 8$
21	132 students	Months containing 31 days are January (20), March (32), May (12), July (12), August (20), October (16), December (20). Total = 132

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22	232 students	Taking the total from Q.21, add February (16), April (20), June (20), September (24), November (20) = 100 $132 + 100 = 232$
23	6850 metres	Luna walked 3200 metres and her sister walked (3200 + 450) 3650 metres. $3200 + 3650 = 6850$ metres
24	E	2:30 is equal to 3:45. 45 blueberries
25	(8,5)	The exact centre of the star will be at point (8,5).
26	4 weeks	Laila earns $\pounds 4.62 \times 4$ per week ( $\pounds 18.48$ ). Half of $\pounds 18.48 = \pounds 9.24$ $\pounds 9.24 \times 4 = \pounds 36.96$ 4 weeks
27	Annie	Bryan's garden has an area of 20.4 metres $\times$ 8 metres (163.2m <sup>2</sup> ). Annie's garden has an area of 16 metres $\times$ 10.4 metres (166.4m <sup>2</sup> ). Therefore, Annie has the largest garden.
28	32 poodles	$\frac{1}{3}$ of 84 = 28. $\frac{2}{7}$ of 84 = 24 $28 + 24 = 52$ $84 - 52 = 32$ poodles
29	100%	There are 30 margherita pizzas sold and 60 Hawaiian pizzas sold. $30 + 100\%$ of 30 (30) = 60
30	$\frac{1}{3}$	The total number of pizzas sold equals (30 + 70 + 60 + 50) 210 $\frac{7}{210}$ is equal to $\frac{1}{3}$
31	1 in 4	There are (2 + 5 + 1) 8 maths classrooms. The probability, therefore, is 2 in 8, simplified to 1 in 4
32	10 packets	4:6 is equal to $\frac{2}{3}$ $\frac{2}{3}$ of 15 = 10
33	3.75%	$\frac{7.5}{200}$ is equal to $\frac{3.5}{100}$ 3.75%
34	30 seconds	0.50 of a minute is equal to $\frac{1}{2}$ of a minute, which is 30 seconds.
35	53	The range is the difference between the largest number and the smallest number. $60 - 7 = 53$
36	9 hrs 35 mins	21.50 to 06:50 = 9 hours. 06:50 to 07:25 = 35 minutes Leon sleeps for 9 hours 35 minutes.
37	$\pounds 7.99$	$\pounds 35.56 - \pounds 3.60 = \pounds 31.96$ $\pounds 31.96 \div 4 = \pounds 7.99$



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38	11.25cm <sup>2</sup>	The shape may be divided into five squares with sides measuring 1.5cm. $1.5 \times 1.5 = 2.25\text{cm}^2$ $5 \times 2.25\text{cm}^2 = 11.25\text{cm}^2$
39	D	The nearest value to 90mph is 85mph.
40	1 in 9	The total number of items equals $(7 + 6 + 3 + 3)$ 19. One item has already been won, leaving 18 items. There are two boxes of truffles left. Therefore, the probability is 2 in 18, simplified to 1 in 9.
41	£12,500.00	$60 \div 12 = 5$ $5 \times \text{£}2500 = \text{£}12,500$
42	E	$99\text{p} + 99\text{p} + 65\text{p} = \text{£}2.63$
43	72°	Angles in a triangle add up to 180°. This triangle is a right-angled triangle. $90^\circ + 18^\circ = 108^\circ$ $180^\circ - 108^\circ = 72^\circ$
44	£3454	$\text{£}7432 - \text{£}524 = \text{£}6908$ $\text{£}6908 \div 2 = \text{£}3454$ Harry has the smaller amount £3454 Bridget will have $(\text{£}3454 + \text{£}524)$ £3978
45	$\frac{3}{24}$	The common number is 24. $\frac{3}{4}$ of 24 = 18 $18 \div 6 = \frac{3}{24}$

### Test 4 p.29

1	C	The 2 has the value of 2 hundredths.
2	15 points	$\text{£}45.62 \div \text{£}3 = 15.2$ . Therefore, 15 points will have been earned.
3	18 hours	$8 \times 90$ minutes = 720 minutes (12 hours) 9am to 3pm = 6 hours per day at school $6$ hours per day $\times 5 = 30$ hours $30$ hours – 12 hours = 18 hours
4	144m <sup>2</sup>	The area will equal the area of the field minus the area for the tools and tractor. The area of the field = $20\text{m} \times 8\text{m}$ (160m <sup>2</sup> ) The area for the tools and tractor = $(4\text{m} \times 4\text{m}) = 6\text{m}^2$ $160\text{m}^2 - 16\text{m}^2 = 144\text{m}^2$
5	B	$9a - 13 = 2a + 50$ $9a - 2a = 50 + 13$ $7a = 63$ $a = 63 \div 7$ (9)

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6	Haley	Haley has the ball nearest to the hole. This can be seen by counting the squares.
7	84 doctors	$126 \div 3 = 42$ $42 \times 2 = 84$
8	875ml	Ananya will need 175ml of PVA glue per person. For five balls of slime, she will need $175\text{ml} \times 5$ (875ml)
9	D	523.7282 rounded to two decimal places is 523.73 as the final digit is rounded up from 2 to 3
10	127	Priti 26, Nadia ( $26 + 27$ ) 53, Sami ( $53 - 5$ ) 48 $26 + 53 + 48 = 127$
11	90 vehicles	1 hour = 60 minutes. Each check-in point can process 30 vehicles every 60 minutes. Therefore, in 3 hours, $30 \times 3$ vehicles (90 vehicles) can be registered.
12	20	One-third of 48 = 16. One-quarter of 48 equals 12 $48 - (16 + 12) = 20$
13	40 minutes	60km/h is equal to 1 kilometre per minute. Therefore, a journey of 40km will take 40 minutes.
14	1 in 4	There are 8 tulips, 5 lilies, 9 roses and 2 orchids (24). 6 out of 24 flowers are yellow tulips. Therefore, the probability of picking a yellow tulip is 6 in 24, simplified to 1 in 4
15	£24	40% of £40 = £16 $£40 - £16 = £24$
16	121°	Angles in a pentagon add up to $540^\circ$ $68^\circ + 123^\circ + 139^\circ + 89^\circ = 419^\circ$ $540^\circ - 419^\circ = 121$ degrees
17	C	The indoor tables will seat ( $6 \times 2$ ) 12, plus ( $2 \times 4$ ) 8, plus ( $4 \times 6$ ) 24 Total indoor capacity 44 The outdoor tables will seat ( $15 \times 6$ ) 90 $44 + 90 = 134$
18	£22	The football shirt will cost $£44 + £3$ as there are three letters in 'Tia'. $£47 - £25 = £22$
19	0.92kg	The weight of the suitcase equals $1.32\text{kg} + 9.6\text{kg} + 2\text{kg} + 1.5\text{kg} + 1.5\text{kg}$ (15.92kg). $15.92\text{kg} - 15\text{kg} = 0.92\text{kg}$
20	£32.50	60% of £650 equals £390, leaving ( $£650 - £390$ ) £260 £260 split evenly amongst Nathan's step-mum, four grandparents and three aunts (eight people) = £32.50
21	8.93	$\frac{893}{100}$ is equal to 8.93

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22	E	$(-3,2)$ $(1,2)$ $(3,3)$ $(1,-1)$ $(-3,-1)$ $(-4,-2)$
23	17:05	160 minutes is equal to 2 hours and 40 minutes. 14:25 plus 2 hours and 40 minutes = 17:05
24	E	If the last two digits of a number are divisible exactly by 4, then the number will be divisible by 4 The last two digits of 824 are divisible exactly by 4
25	10km	The perimeter of the wood = 12km and will consist of $6x$ Therefore, $x = 12 \div 6$ (2km). The family walk for $2 + 4 + 4$ (10km).
26	£2	If three hash browns cost £1.20, then one must cost 40p. Five hash browns will cost $40p \times 5$ (£2).
27	£0.77	$35\%$ of £2.20 = 77p
28	1 in 4	The red team consists of Marina's brother plus $1 + 2 + 4$ (8 in total). The probability = 2 in 8, simplified to 1 in 4
29	74,900 fans	74,851 rounded to the nearest hundred is 74,900
30	126 sachets	$3 \times 3 \times 14 = 126$ sachets
31	£2.60	Separately, the items would cost $£2.15 + £2.80 + £0.65$ (£5.60). A meal deal costs £3. Therefore, the saving will be £2.60
32	122 days	March (31 days), April (30 days), May (31 days) and June (30 days) $31 + 30 + 31 + 30 = 122$ days
33	99 dogs	One-seventh of 112 = 16 $112 - 16 = 96$ $96 + 3 = 99$ dogs
34	D	$425 - 119 = 306$ $\frac{306}{425} = 72\%$
35	8:30pm	11am + 2 hours 30 minutes = 1:30pm 1:30pm + 7 hours = 8:30pm
36	(1,0)	If the sofa is translated four points to the right and three points up, point B will be at coordinate (1,0).
37	3 plants	1.75m is equal to 175cm. $175\text{cm} \div 45\text{cm} = 3.888$ . Therefore, a total of 3 plants may be planted.
38	1620 calories	$424 + 556 + 640 = 1620$ calories
39	707 students	$13 \times 29 = 377$ $11 \times 30 = 330$ $377 + 330 = 707$ students
40	9.25	Jenny is 9 years and 3 months old - 9.25

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41	49 minutes	Radha can run 1 kilometre in 7 minutes ( $35 \div 5$ ). $7 \times 7 = 49$ minute
42	$52\text{m}^2$	$10\text{m} \times 4\text{m} + (3\text{m} \times 4\text{m})$ , $40\text{m}^2 + 12\text{m}^2$ . ( $52\text{m}^2$ ) Or, $(4\text{m} \times 6\text{m}) + (4\text{m} \times 7\text{m})$ . $24\text{m}^2 + 28\text{m}^2$ . ( $52\text{m}^2$ )
43	8	There are 8 right-angles in the playground.
44	105 minutes	20mph is equal to one mile every three minutes. $35 \times 3 = 105$ minutes
45	630 pages	$45 \text{ pages} \times 14 = 630 \text{ pages}$

### Test 5 p.37

1	C	Tea for 6 requires $200\text{ml} \times 6$ (1,200). 1200ml is equal to 1.2 litres.
2	140ml	$(30 \text{ ml} \times 3) 90\text{ml} + (15\text{ml} \times 2) 30\text{ml} = 120\text{ml}$ 0.2cl is equal to 20ml $120\text{ml} + 20\text{ml} = 140\text{ml}$
3	12 years	If Willa was born two years after the wedding, her parents must have been married for six years. Therefore, they have known each other for 12 years.
4	1.05kg	0.35kg is equal to 350g, 0.4kg is equal to 400g $350\text{g} + 400\text{g} + 300\text{g} = 1050\text{g}$ , which is equal to 1.05kg
5	1 in 7	The total number of children is $(12 + 9 + 19 + 14 + 22 + 4 + 18)$ 98 14 children from Taiwan mean a probability of 14 in 98
6	3 children	If the total bill is £38 and an adult ticket costs £14, the children's tickets must total (£38 minus £14) £24 $£24 \div £8 = 3$ children
7	Andi	By counting the squares, Andi has the furthest to run.
8	£56	$£105 \div 15 = £7$ $£7 \times 8 = £56$
9	28 seats	$22 \times 14 = 308$ $308 - 280 = 28$ seats
10	1792	$2160 - 368 = 1792$ $3603 - 1811 = 1792$
11	15 taxis	$72 \div 5 = 14.4$ . Therefore, 15 taxis will be required.
12	05:10	The latest ferry would be the one that departs at 07:40, which requires a check-in time of 06:55. $06:55 - 1.75 \text{ hours (105 minutes)} = 05:10$

## Extended answers for 11+ Mathematics Test Papers

13	17:00	If they leave home at 13:30, they will arrive in Dover at 15:15, which is too late to check in for the 15:10 departure. They will be able to catch the 17:00 ferry.
14	20 minutes	If the family leave home at 13:30, they will arrive in Dover at (13:30 + 75 minutes) 14:45. Therefore, the family will miss their check-in time by 20 minutes.
15	16 people	$\frac{5}{8}$ of 128 = 80, $\frac{1}{4}$ of 128 = 32 $128 - (48 + 32) = 16$ people
16	D	$20 \times 39 = 780$ $5\% \text{ of } 780 = 39$ $780 - 39 = 741$
17	28	The difference between each number is increasing by one each time. $21 + 7 = 28$
18	4 hours 47 minutes 30 seconds	4 hours and 10 minutes = 250 minutes $15\% \text{ of } 250 \text{ minutes} = 37.5 \text{ minutes}$ Total screen time last week = $(250 + 37.5) 287.5$ minutes $287.5 \text{ minutes} = 4 \text{ hours } 47 \text{ minutes and } 30 \text{ seconds}$
19	22.5km	30km/h is equal to 7.5 kilometres per 15 minutes $7.5 \text{ kilometres} \times 3 = 22.5\text{km}$
20	3	The number that occurs the most is 3
21	(0,2)	If the shape is translated one point up and four points to the right, point E would be at (0,2).
22	£4500	Ritvik earns $(£30 \times 5)$ £150 per day. $£150 \times 5 = £750$ $£750 \times 6 = £4,500$
23	8 nappies	$7x + 4 = 60$ $7x = 60 - 4$ $7x = 56$ $x = 8$
24	B	3.6 has the largest value.
25	£900	$£50 \times 18 = £900$
26	18:40	There are 360 degrees in the centre of an analogue clock. 240 degrees would represent a movement of 40 minutes anticlockwise. $7:20\text{pm} - 40 \text{ minutes} = 18:40$
27	360g couscous & 540ml water	For one person, Arlo will need 60g couscous and 90ml water. For six people, he will need $(60 \times 6 \text{ couscous}) + (90 \times 6 \text{ water})$ . 360g & 540ml

## Extended answers for 11+ Mathematics Test Papers

28	56cm	1.53 metres is equal to 153 centimetres. $153\text{cm} \times 97\text{cm} = 56\text{cm}$
29	3 in 5	There are a total of $(8 + 4 + 4 + 4)$ 20 cookies. 12 cookies are not Callum's mother's favourite. The probability equals 12 in 20, simplified to 3 in 5
30	E	820 is not divisible exactly by six.
31	2 hot dogs	$24 \div 8 = 3$ hot dogs each $24 \div 12 = 2$ hot dogs each
32	$84.25\text{cm}^2$	$4\text{cm} \times 1.5\text{cm}$ $7\text{cm} \times 7\text{cm}$ ( $15\text{cm} - 1.5 - 6.5$ ) $6.5\text{cm}^2 \times 4.5\text{cm}^2$ The total is $84.25\text{cm}^2$
33	14 teachers	$\frac{1}{3}$ of 30 = 10 teachers $\frac{1}{5}$ of 30 = 6 teachers $10 + 6 = 16$ teachers $30 - 16 = 14$ teachers
34	(4,4)	Boats D and A will collide at coordinate (4,4).
35	176 passengers	212 passengers are on the train when it leaves. $(40 + 12)$ 52 passengers join the train and $(23 + 65)$ 88 passengers leave the train. The difference is 36 passengers. $212 - 36 = 176$ passengers
36	£28.56	$58\%$ of £68 = £39.44 $£68 - £39.44 = £28.56$
37	210 stitches	Each suit has $(2 + 2 + 2 + 1)$ 7 buttons. $6$ suits $\times$ 7 buttons = 42 buttons in total $42 \times 5 = 210$ stitches
38	D	$40$ metres $\div$ 0.5 = 80 seconds
39	Route D	Perpendicular describes a line that is at a right angle ( $90^\circ$ ) to another line. Route D is perpendicular to the A11.
40	20.6cm	If the shape is a square, then each side must measure $(82.40\text{cm} \div 4)$ , which is 20.6cm.
41	A	$225 \div 15 = 15$

## Extended answers for 11+ Mathematics Test Papers

42	261 cars	$5 \times 45 = 225$ $20\% \text{ of } 45 = 9$ $45 - 9 = 36$ $225 + 36 = 261 \text{ cars}$
43	178 cars	Monday is 42 cars, Tuesday 52, Wednesday ( $42 \times 2$ cars) 84 cars $42 + 52 + 84 = 178 \text{ cars}$
44	£250	$£5000 \div 20 = £250$

### Test 6 p.45

1	E	$92p \times 26 = £23.92$
2	£420	7:3 is equal to £420:£180
3	4500	$5^3 = 125$ $6^2 = 36$ $125 \times 36 = 4500$
4	(3,2)	If points B and C are extended three places up, point C will be at coordinate (-1,2). After the move four points to the right, point C will be at (3,2).
5	411 pages	$\frac{1}{4}$ of 548 = 137 $548 - 137 = 411 \text{ pages}$
6	1 in 10	Total number of fish = ( $7 + 9 + 4 + 7 + 3$ ) 30 There are three angelfish. Therefore, the probability equals 3 in 30, which is simplified to 1 in 10
7	19:30	8pm on the 24-hour clock = 20:00 20:00 – 30 minutes is 19:30
8	D	Ravi spends $5x + 2x = 7x$ $7x = £14.70$ $x = £14.70 \div 7$ (£2.10)
9	Door D	Door D has 8 sides and is therefore octagonal.
10	27 channels	Sienna regularly watches $\frac{1}{5}$ of the channels. $\frac{1}{5}$ of 135 = 27 channels
11	58	Multiples of 7 and 8 between 40 and 60 are: 42, 49, 56 and 40, 48, 56. (This suggests 58.) Multiples of 9 between 40 and 60 are 45 and 54. (This confirms 58.)

## Extended answers for 11+ Mathematics Test Papers

12	£4.32	$£3.99 \times 3 = £11.97$ $£11.97 + 99p = £12.96$ $£12.96 \div 3 = £4.32$
13	33p	$99p \div 3 = 33p$
14	63,000	5:4 is equal to 35,000:28,000 $35,000 + 28,000 = 63,000$
15	3.5km	$400m + 700m + 400m + 2000m = 3,500m$ or 3.5km
16	9025m <sup>2</sup>	The area of the car park will equal the whole area minus the area of the DIY store. Store = $(85m \times 35m)$ 2,975m <sup>2</sup> Entire area = $(200m \times 60m)$ 12,000m <sup>2</sup> $12,000m^2 - 2,975m^2 = 9,025m^2$
17	165 conkers	One-twelfth of 180 = 15 $15 \times 11 = 165$ conkers
18	1 in 2	Desserts that contain fruit are apple crumble, strawberry cheesecake and fruit salad. There are six desserts in total. Therefore, the probability is 3 in 6, which is simplified to 1 in 2
19	20 floors	Ali travels to floor 7, then down four floors (11 floors). He then travels up to floor 12, which is another 9 floors. $11 + 9 = 20$
20	8 trips	Shortfall of water in the paddling pool = $(700 \text{ litres} - 380 \text{ litres})$ 320 litres. $320 \text{ litres} \div 40 = 8$ trips
21	38 items	$6 + 4 + 12 + 8 + 8 = 38$ items.
22	12%	The total weight of the ingredients equals: $40g + 110g + 240g + 200g + 70g + 45g + 45g = 750g$ . 90g of the ingredients are solely nuts. $\frac{90}{750} = 12\%$
23	8	The range is the difference between the largest and the smallest. $14 - 6 = 8$
24	D	Malcolm should have been charged: $£15 + £8.50$ for the shorts (£23.50), $£9.50$ for the T-shirt + $£6.99$ for the towel, which totals £39.99. He paid £46.49, which is £6.50 too much.
25	20cm	The surface area of each face of the cube equals $2.4m^2 \div 6$ (400cm <sup>2</sup> ). The square root of 400cm is 20cm.
26	15.6°C	$13.2^\circ\text{C} + 2.4^\circ\text{C} = 15.6^\circ\text{C}$
27	£12,000	$£36,000 \div 3 = £12,000$



## Extended answers for 11+ Mathematics Test Papers

28	13	If the mean of three numbers is 14, the numbers must total 42. $9 + 20 = 29$ $42 - 29 = 13$
29	6 days	28th September plus 14 days = 12th October 12th October is 6 days after 6th October
30	£6	Klara's brother's meal cost $x$ , Klara's meal cost $2x$ . Klara's dad's meal cost $4x$ $7x = £21$ $x = 3$ Klara's meal cost $2x$ (£6)
31	£270	Emma's birthday money increases by £15 every birthday. By her 18th birthday, she will expect $18 \times £15$ (£270).
32	120 rows	$24 \text{ boxes} \times 40 \text{ bulbs} = 960$ $960 \div 8 = 120 \text{ rows}$
33	£9	Patrick spends: $(4 \times £1) + (2 \times £0.50) + (8 \times £0.20) + (10 \times £0.01) + (15 \times £0.01) +$ $(2 \times £1) + £0.10$ $£4 + £1 + £1.60 + 10p + 15p + £2 + 10p = £8.95$ , which, to the nearest pound, is £9
34	4 minutes	1.2 hours is equal to 72 minutes. $72 \div 18 = 4$ minutes
35	2625 tickets	The smaller sections must hold $(4000 - 1,000) \div 4$ . (750). Three smaller sections equal $(750 \times 3)$ 2250 0.5 of a smaller section equals 375 people. $2250 + 375 = 2625$ tickets
36	5.4g	$40\% \text{ of } 9\text{g} = 3.6\text{g}$ $9\text{g} \text{ minus } 3.6\text{g} = 5.4\text{g}$
37	E	Forward 2, right 2, forward 3
38	£30	$(2 \times £6.50) + (3 \times £1.30) + £8 = £24.90$ $£24.90 + £5.10 = £30$
39	B	All regular 2d shapes have the same number of lines of symmetry as they have sides. A decagon has ten sides (ten lines of symmetry), a hexagon has six sides (six lines of symmetry). $10 - 6 = 4$
40	5 people	$£49.50 \div 3 = £16.50$ . Therefore, that is the cost of one meal $£82.50 \div £16.50 = 5$ people
41	600g	The difference between 95kg and 89kg is 6kg which is equal to 6000g. $6000\text{g} \div 10 = 600\text{g}$
42	£25,000	$£230,000 - £80,000 = £150,000$ $£150,000 \div 6 = £25,000$

## Extended answers for 11+ Mathematics Test Papers

43	20%	The bill would have totalled (£28 + £7) £35 £7 out of £35 is equal to 20%
44	10.5 hours	21 miles ÷ 3 = 7 7 × 1.5 = 10.5 hours
45	35 cups	Number of cups totals: 23 + 38 + 42 + 32 + 40 (175) 175 ÷ 5 = 35 cups

### Test 7 p.53

1	B	$\frac{5}{8}$ is equal to 0.625. Therefore, 0.624 is the nearest.
2	82 people	2 + 16 + 16 + 48 = 82
3	70°	Angles in a quadrilateral add up to 360 degrees. 110° + 90° + 90° = 290° 360° - 290° = 70°
4	1 in 5	The total number of animals = (11 + 27 + 3 + 4 + 1 + 9) 55 There are 11 deer. The probability equals 11 in 55, which is simplified to 1 in 5
5	E	The total liquid = (350ml + 350ml) 700ml. The amount of liquid left over = 700ml - 637ml = 63ml. $\frac{63}{700}$ is equal to 9%
6	£10.45	Ken normally pays £20. He has to pay (21 × £1.45) £30.45 £30.45 - £20. = £10.45
7	38 pieces	$\frac{1}{6}$ of 60 = 10 and $\frac{1}{5}$ of 60 = 12 10 + 12 = 22 60 - 22 = 38 pieces
8	B	The actual profit = £5.04 - £2.40 (£2.64). £2.40 × 110% = £5.04
9	90km/h	150 kilometres covered in 100 minutes = 1.5km each minute. 1.5 × 60 = 90 km/h
10	35%	There are 20 squares, seven of which have not been searched. $\frac{7}{20}$ is equal to, $\frac{35}{100}$ which is 35%
11	3.4kg	Finn and his guests equals four people. He will need (200g × 4) + (300g × 4) + (250g × 4) + (100g × 4). 800g + 1200g + 1000g + 400g The total equals 3400g, which is 3.4kg.

## Extended answers for 11+ Mathematics Test Papers

12	1 in 5	There are $(2 + 3 + 4 + 1)$ items (10). There two bottles of conditioner. Therefore, the probability is 2 in 10, which is simplified to 1 in 5
13	41g	$900\text{g} - 80\text{g} = 820\text{g}$ $820\text{g} \div 20 = 41\text{g}$
14	10:11	The ratio of rice to meat (chicken & chorizo) is 250g: 275g. Simplified to 10:11
15	200g	The quantity calls for 25g of chorizo per person, and needs to be multiplied by 8 $25\text{g} \times 8 = 200\text{g}$
16	112 miles	2 hours at 48 miles per hour = 96 miles 20 minutes at 48 miles per hour = 16 miles $96\text{ miles} + 16\text{ miles} = 112\text{ miles}$
17	B	If $\frac{5}{6}$ is equal to 75, then $\frac{1}{5}$ equals 15 $15 \times 6 = 90$
18	50g	Dominik will need to multiply the amount of flour by 2.4 $250\text{g} \times 2.4 = 600\text{g}$ He would therefore require another 50g of flour.
19	19 houses	There be 19 house numbers: 1, 3, 5, 7, 9, 11, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37 and 39
20	160 seconds	$400 \div 2.5 = 160\text{ seconds}$
21	C	Up 5, right 1, down 1, right 3, down 3, right 1
22	£34.63	$\pounds 102.88 - \pounds 68.25 = \pounds 34.63$
23	960 stitches	8 hours = 480 minutes $480 \times 2 = 960\text{ stitches}$
24	50 minutes	Joan has $(1860 - 960)$ 900 stitches left. 100 stitches per day would take 50 minutes a day.
25	26 hrs 40 mins	3 stitches every 6 minutes = 30 stitches per hour. $800 \div 30 = 26.66$ or 26 hours and 40 minutes
26	25	$2x = 12$ $3z = 21$ $4y = 8$ So $2x + 3z - 4y = 12 + 21 - 8 = 25$
27	D	Hamza will see the shape as in option D.
28	55 jelly beans	Half of 248 = 124 $248 - (124 + 45 + 24) 193 = 55$

## Extended answers for 11+ Mathematics Test Papers

29	2 in 11	There are a total of $(15 + 21 + 8)$ 44 holes The probability equals 8 in 44, which is simplified to 2 in 11
30	0.88 metres	2.5 metres is equal to 250cm 1.62 metres is equal to 162cm $250\text{cm} - 162\text{cm} = 88\text{cm}$ or 0.88 metres
31	C	A hexagonal prism has eight faces and a hexagonal pyramid has seven.
32	208 tickets	$624 \div 6 = 104$ $104 \times 4 = 416$ children's tickets sold $624 - 416 = 208$ adult tickets sold
33	$34\text{m}^2$	The area of the lawn will be the entire area minus the patio and the shed. The whole area will be $(10\text{m} \times 6\text{m})$ $60\text{m}^2$ The area of the patio will be $(6\text{m} \times 3\text{m})$ $18\text{m}^2$ The shed occupies an area of $(4\text{m} \times 2\text{m})$ $8\text{m}^2$ $60\text{m}^2 - (18\text{m}^2 + 8\text{m}^2) = 34\text{m}^2$
34	0.143km	$300\text{m} - 157\text{m} = 143\text{m}$ , which is equal to 0.143km
35	7 and 11	The two factors of 77 which are prime numbers are 7 and 11.
36	6	Ada, Petula, Giorgio, Charley, Rea and Maira will be having lemonade and chips.
37	12.5%	Petula & Nikita will be having fruit salad which is 2 children. 2 out of 16 = 12.5%
38	$\frac{3}{8}$	Inga, Adam, Siva, Nikita, Rea and Maira will be having crisps. This is 6 out 16, which is simplified to $\frac{3}{8}$
39	25%	Inga, Ada, Monika and Ryan will be having chocolate cake. 4 out of 16 is equal to 25%
40	(3,3)	The most solitary 'R' on the plan is at coordinate (3,3).
41	D	10cm is equal to 100mm $100\text{mm} \div 2.5 = 40$ weeks
42	18 residents	The prime numbers between 1 and 64 are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59 and 61
43	7	$10 + 8x + 23 = 89$ $8x = 89 - 10 - 23$ $8x = 56$ $x = 7$
44	65+	The modal age is the most occurring. There are 45 passengers in the 65+ age range.