Maths Mock Test Paper 27 Answers

Q#	Answer	Explanation
1	B	1 metre is 100 cm, and 3/10 of 100 cm is 30 cm, so the red part is 30 cm. The red and blue together are 30 + 45 = 75 cm, which leaves 100 − 75 = 25 cm of white.
2	E	Each number is double the one before, take away 1: 3 × 2 − 1 = 5, 5 × 2 − 1 = 9 and 9 × 2 − 1 = 17. So the missing number is 17 × 2 − 1 = 33, and checking the next step, 33 × 2 − 1 = 65. The gaps 2, 4, 8, 16, 32 double each time too, which gives the same answer.
3	A	To the nearest kilogram the tenths digit decides. It is 4, which is less than 5, so 2.46 rounds down to 2 kg. To one decimal place the hundredths digit decides. It is 6, which is 5 or more, so 2.46 rounds up to 2.5 kg. Kai is right both times.
4	B	A horizontal mirror line runs across the middle of the letter, so the top half must reflect onto the bottom half. That works for B. A, M, T and V each have a vertical line of symmetry instead, running from top to bottom.
5	A	The hundred-thousands digit of 8,946,512 is 9. One more hundred thousand makes ten of them, which is another million, so the millions digit goes up from 8 to 9 and the hundred-thousands digit becomes 0. The answer is 9,046,512. 8,956,512 is ten thousand more and 9,946,512 is a million more.
6	D	Undo her mistake first: the number she started with is 216 ÷ 6 = 36. Dividing that number by 6, as she was meant to, gives 36 ÷ 6 = 6. The answer 36 is the starting number, not the answer she should have got.
7	E	The 7 cm by 3 cm rectangle has a perimeter of 7 + 3 + 7 + 3 = 20 cm and an area of 7 × 3 = 21 cm². A 6 cm by 4 cm rectangle also has a perimeter of 6 + 4 + 6 + 4 = 20 cm, but its area is 6 × 4 = 24 cm². 3 cm by 7 cm is the same rectangle turned round, so its area is the same, and the other three have perimeters of 22 cm, 18 cm and 22 cm.

myFreeSchool

8	B	The first Saturday is the 3rd. Adding a week each time gives 3 + 7 = 10, then 17, 24 and 31. The month has 31 days, so the 31st is in it, making 5 Saturdays.
9	C	The mode is 7 because it is the only number that appears twice. If one of the 7s is taken away, the cards left are 3, 7, 9 and 4, each appearing once, so 7 is no longer the mode. Taking away the 3, the 4 or the 9 leaves both 7s, and 7 is still the mode.
10	A	She has 20 − 17.6 = 2.4 kg of space left, which is 2,400 g. The bag of books is 2,300 g, which fits. The boots are 2,500 g, the coat 3,100 g, the camera bag 2,600 g and the hairdryer 4,100 g, and all of those are too heavy.
11	D	From −14 up to −2 is 12, and that climb is made in 3 equal steps, from −14 to a, a to b and b to −2. Each step is 12 ÷ 3 = 4, so a is −10 and b is −6. Then c is 4 more than −2, which is 2.
12	C	The 5-hour job has 3 more hours than the 2-hour job and costs 180 − 90 = 90 pounds more, so each hour costs 90 ÷ 3 = 30 pounds. The 2-hour job is then 2 × 30 = 60 pounds of work, so the call-out fee is 90 − 60 = 30 pounds. The answer £45 comes from sharing £90 between 2 hours and forgetting the fee.
13	D	In direct proportion, doubling the mass doubles the price and tripling the mass triples it. At Shop D, 2 kg costs £3, 4 kg costs £6 and 6 kg costs £9, so it works. Shop A adds £2 each time instead, Shop B's 4 kg bag is not double its 2 kg bag, Shop C's 6 kg bag should be £9 and Shop E's 4 kg bag should be £4.
14	E	1.5 km is 1,500 m, and 1,500 m is 150,000 cm. Each stride is 60 cm, so he takes 150000 ÷ 60 = 2500 strides.
15	A	A price that rounds to £5 is at least £4.50 and at most £5.49. So four such prices total at least 4 × 4.50 = 18 pounds and at most 4 × 5.49 = 21.96 pounds. £22.00 is more than £21.96, so it cannot be the total. Each of the others is in the range.
16	D	36 × 25 is one more lot of 36 than 36 × 24, so it is 864 + 36 = 900. Adding 1 or 24 or 25 instead of 36 gives the wrong answers 865, 888 and 889.

myFreeSchool

17	B	Counting from the front, there are 6 people ahead of Lucy. Counting from the back, there are 11 people behind her. With Lucy herself that makes 6 + 1 + 11 = 18. Adding 7 and 12 to get 19 counts Lucy twice.
18	C	Write each number to three decimal places: 0.600, 0.660, 0.606, 0.066 and 0.650. In order from smallest they are 0.066, 0.600, 0.606, 0.650 and 0.660, so the middle one is 0.606.
19	E	Turning clockwise from north-east, she reaches east after 45°, then south after another 90°. That is 45 + 90 = 135°. Turning the other way round would be 225°, but she turned clockwise.
20	B	The rectangle runs from −5 to −1 across and from 1 to 4 up. The point (−3, 2) is inside both of those ranges. (−2, 5) is too high, (−6, 3) is too far left, (0, 2) is too far right, on the y-axis, and (−3, −1) is too low.
21	C	Sam got 24 ÷ 4 × 3 = 18 questions right. 90% of 24 is 21.6, and he cannot get part of a question right, so he needs at least 22. That is 22 − 18 = 4 more. Getting 3 more would give 21, which is only 87.5%.
22	E	Change every time to seconds. Ali took 60 + 23.4 = 83.4 seconds, Cara took 62.5 seconds and Dan took 60.8 seconds, while Ben took 58.9 seconds. The fastest is Ben and the slowest is Ali, and 83.4 − 58.9 = 24.5 seconds. Treating 1 minute as 100 seconds gives the wrong answer of 64.5.
23	A	In one hour the tortoise walks 3 × 60 = 180 metres. There are 1,000 metres in a kilometre, so 180 m is 180 ÷ 1000 = 0.18 km. Its speed is 0.18 km/h.
24	D	The range of the four scores is 12 − 3 = 9. A new score keeps the range at 9 only if it is not below the lowest score, 3, and not above the highest, 12. Of the options, only 7 is between 3 and 12. Scores of 1 or 2 would stretch the bottom of the range, and 13 or 15 the top.
25	A	The 12 cm side is shared between 4 rectangles, so each is 12 ÷ 4 = 3 cm wide and 12 cm long. The perimeter of one rectangle is 12 + 3 + 12 + 3 = 30 cm.

myfreeschool

26	D	123 is 121 + 2, and 121 = 11 × 11, so it is 2 more than a square. It is also 125 − 2, and 125 = 5 × 5 × 5, so it is 2 less than a cube. The others fit only one clue: 27 and 51 are 2 more than 25 and 49, 66 is 2 more than 64, and 62 is 2 less than the cube 64.
27	B	The 10 moves are five moves right and five moves up. The moves right are 1 + 3 + 5 + 7 + 9 = 25 and the moves up are 2 + 4 + 6 + 8 + 10 = 30. Across comes first in a coordinate, so the robot is at (25, 30).
28	C	There are 2 + 3 = 5 parts, and 60 ÷ 5 = 12, so Ann gets 2 × 12 = 24 pounds and Bo gets 3 × 12 = 36 pounds. After Bo gives £6 away, Ann has 24 + 6 = 30 and Bo has 36 − 6 = 30. They have the same, so the ratio is 1 : 1.
29	E	Six packs hold at most 6 × 8 = 48 pens, which is not enough, so he needs at least 7. Seven packs work: 4 packs of 8 hold 4 × 8 = 32 pens and 3 packs of 6 hold 3 × 6 = 18 pens, and 32 + 18 = 50. The other way to make exactly 50, 1 pack of 8 and 7 packs of 6, uses 8 packs.
30	A	A number is a multiple of 9 when its digits add up to a multiple of 9. The digits shown add up to 5 + 7 + 2 = 14, and the next multiple of 9 is 18, so the missing digit is 18 − 14 = 4. Checking: 5472 ÷ 9 = 608. A missing 9 would make the digits add to 23, which is not a multiple of 9.
31	C	20% of 300 ml is 60 ml of juice. Adding 100 ml of pure juice makes 60 + 100 = 160 ml of juice in 300 + 100 = 400 ml of drink. As a percentage, 160 out of 400 is 40 out of 100, which is 40%.
32	B	The two warm days make 2 + 4 = 6 degrees, and the cold days make 3 + 5 + 1 + 4 = 13 degrees below zero. Together that is 7 degrees below zero, so the total is −7, and sharing it over 7 days gives a mean of −1°C. The days colder than −1°C are Monday, Wednesday and Sunday, which is 3 days. Friday was exactly −1°C, which is not below the mean.

myFreeSchool

33	D	Jo's walking and the walkway's movement add together, so she moves at 1 + 1.5 = 2.5 metres every second. 100 m at 2.5 m/s takes 100 ÷ 2.5 = 40 seconds. Using the walkway on its own gives 100 seconds, and walking against it would give 200 seconds.
34	E	In the bottom-right quadrant both coordinates must be past zero: x positive and y negative. After 3 moves the counter is at (−1, −1), which is below the x-axis but still left of the y-axis. After 4 moves it is at (1, −4), which is in the bottom-right quadrant.
35	A	The sound takes 9 seconds to reach Maya, travelling 340 m every second, so the storm is 340 × 9 = 3060 m away. There are 1,000 m in a kilometre, so that is 3.06 km.
36	B	The answer is between 400 and 499, so the two-digit number is between 58 and 71, and it ends in 3. Trying 63: 63 × 7 = 441, which fits. The neighbours do not: 53 × 7 = 371 and 73 × 7 = 511. So A is 6 and B is 4, and 6 + 4 = 10.
37	C	For the largest product the biggest digits, 8 and 6, go in the tens places, leaving 2 and 4 for the ones. That gives two choices: 82 × 64 = 5248 and 84 × 62 = 5208, so the largest is 5,248. Putting a small digit in a tens place gives much less, such as 86 × 42 = 3612 or 48 × 62 = 2976.
38	E	A time reads the same backwards when the minutes are the hour's digits reversed, like 14:41. That time has already passed, so the next one is in the following hour: 15:51. From 14:48 to 15:51 is 63 minutes.
39	D	Side AB is 8 − 2 = 6 units long. The rectangle has two sides of 6, making 12, so the other two sides share 20 − 12 = 8 units and are 4 units each. The other corners are therefore 4 units across from A and B, at (5, 2) and (5, 8), or on the other side at (−3, 2) and (−3, 8). Of the options, only (5, 8) is one of these.
40	E	Pair each negative number with its positive partner: −10 with 10, −9 with 9, and so on down to −1 with 1. Each pair adds up to 0, and 0 adds nothing. The only numbers without a partner are 11 and 12, and 11 + 12 = 23.

myFreeSchool

41	C	Each full day and night the frog gains 3 − 2 = 1 metre. After 7 days and 7 nights it is 7 m up. On the 8th day it climbs 3 m and reaches 7 + 3 = 10 m, the top, before it can slip back. Counting 1 m a day all the way gives the wrong answer of the 10th day.
42	B	The two squares have perimeters of 4 × 5 = 20 cm and 4 × 3 = 12 cm, which make 20 + 12 = 32 cm. Where they touch, a 3 cm stretch of each square is now inside the shape, so 2 × 3 = 6 cm is lost from the outside. The perimeter is 32 − 6 = 26 cm.
43	A	In order, the middle number is the median, 6. The mode is 4, so the two smallest numbers are both 4. The range is 10, so the largest is 4 + 10 = 14. A mean of 7 means the five add to 5 × 7 = 35, and 4 + 4 + 6 + 14 = 28, so the second largest is 35 − 28 = 7.
44	D	Two odd primes add up to an even number, so an odd number that is the sum of two primes must use the only even prime, 2. 21 = 2 + 19, 25 = 2 + 23 and 31 = 2 + 29 all work, and 20 = 7 + 13. But 27 would need 2 + 25, and 25 is not prime, so 27 cannot be made.
45	C	An isosceles triangle has two equal angles, so the angles that differ by 30° are one of the equal pair and the odd angle. If the odd angle is the bigger one, the equal pair plus 30° make 180°, so each of the pair is 150 ÷ 3 = 50° and the odd angle is 50 + 30 = 80°, giving 50°, 50° and 80°. If the odd angle is the smaller one, the angles are 70°, 70° and 40°, whose largest is 70°, which is not offered. So the largest angle could be 80°.
46	E	3 hens lay 3 eggs in 3 days, so 1 hen lays 1 egg in 3 days. In 6 days one hen lays 2 eggs, so 6 hens lay 6 × 2 = 12 eggs. Doubling the hens doubles the eggs, and doubling the days doubles them again: 3 × 2 × 2 = 12.
47	D	A length of 2.4 m to the nearest 0.1 m could be as short as 2.35 m, because anything from 2.35 m rounds up to 2.4 m. Five planks of the shortest length make 2.35 × 5 = 11.75 m. The longest the total could be is just under 2.45 × 5 = 12.25 m.

myFreeSchool

48	B	3.5 tonnes is 3,500 kg. The sand uses 1,200 kg, leaving 3500 − 1200 = 2300 kg. Each bag is 25 kg, and 2300 ÷ 25 = 92 bags. The answer 140 forgets the sand, since 3500 ÷ 25 = 140.
49	C	The girls are 100 − 40 = 60% of the class. A quarter of the 40% who are boys is 10% of the class, and half of the 60% who are girls is 30% of the class. Together that is 10 + 30 = 40% of the class. Averaging 25% and 50% to get 37.5% forgets that there are more girls than boys.
50	A	Try 6: 6 ÷ 2 + 9 = 12, and 6 × 2 = 12, so both sides match. As an equation, doubling n and halving it are 1.5n apart, so 1.5n = 9 and n = 6. Trying 3 gives 3 ÷ 2 + 9 = 10.5 against 3 × 2 = 6, and trying 18 gives 18 ÷ 2 + 9 = 18 against 18 × 2 = 36.

myfreeschool