Maths Mock Test Paper 30 Answers

Q#	Answer	Explanation
1	E	To make the number as large as possible, the biggest digits go first: 6, then 5, then 2, then 0. That gives 6,520, which ends in 0 and so is even. 6,502 is even too, but it is smaller.
2	C	One whole turn of the minute hand takes 1 hour and a half turn takes 30 minutes, so 1 hour 30 minutes passes. The clock shows twenty-five past two, and from 02:25 to 03:55 is 1 hour 30 minutes. 2:55 counts only the half turn.
3	A	Each fraction is one piece short of a whole, so look at the size of the piece. 2/3 is short by 1/3, 3/4 by 1/4, 5/6 by 1/6, 7/8 by 1/8 and 9/10 by 1/10. The smallest piece is 1/10, so 9/10 is closest to 1.
4	E	The dog circle includes the part where it overlaps the cat circle. That is 8 pupils with only a dog and 4 pupils with both, so 8 + 4 = 12 pupils have a dog. 8 forgets the pupils who have a cat as well.
5	D	Going up 7 floors from −2 passes floor 0 and reaches floor 5. Going down 9 floors from there passes floor 0 again and stops 4 floors below it, at floor −4.
6	A	A teaspoon holds about 5 ml, which is why medicine doses are often measured in 5 ml spoons. 50 ml would fill a small egg cup, 500 ml is a large bottle of water and 5 litres is a large bucketful. 0.05 ml is less than a single drop.
7	B	A rectangle 4 squares wide and 3 squares tall has 4 × 3 = 12 squares. The shape has 4 squares in its bottom row, 4 in the next and 2 in the top row, which makes 4 + 4 + 2 = 10. So 12 − 10 = 2 more are needed. 10 is the number of squares already there.
8	A	n + n + n is three lots of n, which is written 3n. The 5 is a plain number, not a number of n's, so it stays separate: 3n + 5. If n is 2, then 2 + 2 + 2 + 5 = 11 and 3 × 2 + 5 = 11 as well.

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9	D	Shape D is a kite, and none of its four sides run in the same direction as another. The rectangle A and the parallelogram C each have 2 pairs of parallel sides, the trapezium B has 1 pair and the regular hexagon E has 3 pairs.
10	C	£2 is 200p. 5 pencils cost 5 × 35 = 175p, and a sixth would make 6 × 35 = 210p, which is too much. So Max buys 5 pencils and gets 200 − 175 = 25p change.
11	D	To the nearest thousand, the hundreds digit decides. Ash has a 4, so it rounds down to 12,000. Birch has a 5, so it rounds up to 13,000. Cedar rounds down to 11,000 and Dale rounds up to 14,000. Elm has a 4, so it rounds down to 13,000. Birch and Elm both give 13,000.
12	B	5 thousands is 5,000, 3 tenths is 0.3 and 4 hundredths is 0.04. Adding them gives 5,000.34. The hundreds, tens and ones are all empty, so they need zeros to hold their places.
13	A	Write them all as percentages: 0.7 is 70%, 72% stays as it is and 3/4 is 75%. So in order they are 0.7, then 72%, then 3/4.
14	E	The number must be a multiple of 4 and also a factor of 48. 16 = 4 × 4 and 48 = 16 × 3, so 16 is both. 20 is a multiple of 4 but not a factor of 48. 6 and 3 are factors of 48 but not multiples of 4, and 18 is neither.
15	B	40 × 6 is one more lot of 6 than 39 × 6, so she has 6 too many. She must subtract 6: 240 − 6 = 234. Subtracting 1 is the common slip, because 39 is 1 less than 40, but it is 1 less for each of the 6 lots.
16	C	Paying in £50 clears the £35 and leaves 50 − 35 = 15 pounds in the account. Spending £28 uses that 15 and goes 28 − 15 = 13 pounds below zero, so the balance shows −£13. £13 forgets that the account has gone below zero.
17	A	The tiles go up by 3 each time and pattern 1 has 5, so pattern n has 3n + 2 tiles. Taking away the 2 from 53 leaves 51, and 51 ÷ 3 = 17. Checking: 3 × 17 + 2 = 53.

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18	B	2 litres is 2,000 ml. Taking away what is left over leaves 2000 − 80 = 1920 ml in the glasses. Each glass holds 1920 ÷ 8 = 240 ml. 250 ml forgets the 80 ml left over, and 260 ml adds it on.
19	C	The triangle has a base of 6 cm and a height of 4 cm. 6 × 4 = 24, and its area is half of that, which is 12 cm². A rectangle with a base of 6 cm and an area of 12 cm² is 12 ÷ 6 = 2 cm tall. 4 cm is the height of the triangle.
20	E	The graph shows that £50 is the same as €60. £150 is 150 ÷ 50 = 3 times as much, so it is worth 3 × 60 = 180 euros. €160 adds £100 to the €60 instead of keeping the rate the same.
21	D	In half an hour at 40 mph he goes 40 ÷ 2 = 20 miles. In half an hour at 60 mph he goes 60 ÷ 2 = 30 miles. Altogether that is 20 + 30 = 50 miles. 100 miles adds the two speeds and forgets that each lasts only half an hour.
22	C	Bought one at a time, the tickets cost 2 × 8 + 3 × 5 = 31 pounds. A family ticket covers 2 adults and 2 children for £22, and the third child pays £5, so the total is 22 + 5 = 27 pounds. £22 leaves out one child.
23	A	x and the 65° angle sit between the two parallel sides, on the same slanting side. Angles placed like that add up to 180°. So x is 180 − 65 = 115°. 65° would only be right if the two angles were equal, which they are not.
24	D	Counting on in 25 minutes from 07:10 gives 07:35, 08:00, 08:25, 08:50 and 09:15. The last one before 09:00 is 08:50, so that is the bus she missed. 09:15 is the next bus, which she can still catch.
25	B	9 children have 1 each, which makes 9 × 1 = 9. 5 children have 2 each, which makes 5 × 2 = 10. 2 children have 3 each, which makes 2 × 3 = 6. The 4 children with none add nothing, so the total is 9 + 10 + 6 = 25. 20 is the number of children in the class.
26	D	The numbers with a 7 in the ones place are 107, 117, and so on up to 197, which makes 10. Those with a 7 in the tens place are 170 to 179, which makes 10 more. But 177 has been counted twice, so the total is 10 + 10 − 1 = 19.

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27	E	Try a price of £100. Going up by 10% adds £10, which makes £110. Going down by 10% takes off 10% of £110, which is £11, leaving £99. That is 1% lower than £100. The two changes do not cancel, because the second 10% is of a bigger amount.
28	D	Factors come in pairs, such as 2 and 6 for 12. The only way to have an odd number of them is for one factor to pair with itself, and that happens only in a square number. The square numbers up to 50 are 1, 4, 9, 16, 25, 36 and 49, which makes 7.
29	A	The tenths digit decides. The smallest such number is 7.5, which rounds up to 8. The largest is 8.4, which rounds down to 8, since 8.5 would round up to 9. The difference is 8.4 − 7.5 = 0.9.
30	E	A zero on the end comes from a factor of 10, which needs a 5 and a 2. There are plenty of even numbers to supply the 2s, so count the 5s. They come from 5, 10, 15 and 20, one each, which makes 4 fives and so 4 zeros. Counting only 10 and 20 gives 2, which misses the others.
31	C	From 7 down to −8 is a fall of 7 + 8 = 15 degrees, over 5 hours. That is 15 ÷ 5 = 3 degrees each hour. By 21:00, 3 hours have passed, so it has fallen 3 × 3 = 9 degrees. 9 degrees below 7 is −2 °C.
32	B	The four numbers have a mean of 64 ÷ 4 = 16, so two lie below 16 and two above it: 13 and 15, then 17 and 19. Checking: 13 + 15 + 17 + 19 = 64. The largest is 19. 16 is the mean, and it is not odd.
33	E	4.5 cm is 45 mm. Sharing that between 500 sheets gives 45 ÷ 500 = 0.09 mm. Checking: 500 × 0.09 = 45. 0.9 mm would make the pile 45 cm high.
34	C	Try a square with sides of 10 cm, so its area is 10 × 10 = 100 cm². The new sides are 15 cm, so the new area is 15 × 15 = 225 cm². That is 225 − 100 = 125 cm² more, which is 125% of the 100 cm² it started with. 225% is the new area, not the increase.
35	B	Try ages in the ratio 2 : 3. 4 and 6 become 9 and 11, and 6 and 9 become 11 and 14, which are not in the ratio 3 : 4. 10 and 15 become 15 and 20, and 15 : 20 is the same as 3 : 4. So Ben is 15 now. 10 is Ali's age.

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36	D	The front has to go through the 400 m tunnel and then a further 200 m for the back to come out, which is 400 + 200 = 600 m. At 20 metres per second that takes 600 ÷ 20 = 30 seconds. 20 seconds forgets the length of the train.
37	C	Each of the 6 teams has a home match against each of the other 5 teams, and every match has exactly one home team. That makes 6 × 5 = 30 matches. 15 counts each pair of teams playing only once.
38	D	Going all the way round, the robot makes one complete turn, which is 360°. Each corner turns it 24°, so there are 360 ÷ 24 = 15 corners and therefore 15 sides.
39	E	In London time the plane lands 7 hours 20 minutes after it leaves: from 09:30 to 16:50 is 7 hours 20 minutes. New York is 5 hours behind, and from 11:50 to 16:50 is 5 hours, so it is 11:50 there. 16:50 is what a clock still set to London time would show.
40	C	Put the 15 matches in order of goals. The median is the 8th, with 7 on either side. The first two bars cover 1 + 6 = 7 matches, so the 8th match is the first one with 2 goals. 1 goal is the mode, the tallest bar, and not the median.
41	A	P is at (2, 3), which is 3 squares to the left of x = 5. Its reflection is 3 squares to the right, at (8, 3). That point is 2 squares above y = 1, so its reflection is 2 squares below, at (8, −1).
42	B	Adding 1 to the top and the bottom of 3/7 gives 4/8, and 4 is half of 8. The others become 2/5, 3/8, 5/8 and 4/9, and none of those is a half.
43	C	One less than the number must divide exactly by 2, 3, 4, 5 and 6. The smallest number that does so is 60, so the number is 60 + 1 = 61. 121 also works, but it is not the smallest.
44	D	The first two rows use A and B only. Row 2 has one more B and one fewer A than row 1, and is 5 bigger, so B is 5 more than A. Then 2A + B is 14 gives A = 3 and B = 8, and checking row 2: 3 + 8 + 8 = 19. Row 3 is then 8 + C + C = 20, so C + C = 12 and C is 6.

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45	A	Draw a 5 by 5 square round it, which has an area of 5 × 5 = 25 cm². That leaves four right-angled triangles in the corners, each 3 cm by 2 cm, with an area of half of 3 × 2, which is 3 cm². So the tilted square has an area of 25 − 12 = 13 cm².
46	B	When A turns twice, 36 × 2 = 72 teeth pass the point where it meets B. The same number of teeth pass between B and C, whatever size B is. So C turns 72 ÷ 8 = 9 times. B's size does not matter: it only passes the movement along.
47	E	Vertically opposite angles are equal, so 3x and x + 40 are the same size. Taking x from both leaves 2x and 40, so x is 40 ÷ 2 = 20. Each angle is then 3 × 20 = 60°, which is the size of the angle and not the value of x. 35 comes from wrongly making the two angles add up to 180°.
48	C	1/3 of 12 is 4, so there are 4 red counters and 8 others. For a probability of 1/2, the red counters must match the others, so there must be 8 red ones. That is 8 − 4 = 4 more. Adding 2 would be right only if the bag stayed at 12 counters, but adding red counters makes the bag bigger.
49	B	All five options have digits adding to 9. Swap the digits of each: 63 − 36 = 27, 72 − 27 = 45, 54 − 45 = 9 and 81 − 18 = 63. Swapping 36 makes it go up. So the number is 63.
50	E	A small cube has paint on exactly two faces if it lies on an edge of the large cube but not at a corner. Each edge has 4 cubes, and 2 of those are corners, which leaves 2. A cube has 12 edges, so that is 12 × 2 = 24 small cubes. The 8 corner cubes have paint on three faces.

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