Maths Mock Test Paper 28 Answers

Q#	Answer	Explanation
1	D	To make the largest number, put the biggest digit in the thousands place, then the next biggest, and so on. The digits cannot repeat, so they are 9, 8, 7 and 6, in that order: 9,876. 9,999 repeats a digit, and 9,867 has the 6 and 7 the wrong way round.
2	C	On 30 June 2024 Mia turned 2024 − 2014 = 10. Her next birthday, when she turns 11, is on 30 June 2025, which had not yet come on 1 June 2025. So she was still 10. Taking 2014 from 2025 gives 11, which forgets that her birthday had not arrived.
3	A	Between 06:00 and 09:00 the temperature went from −4°C up to 1°C: 4 degrees to reach 0 and 1 more, a rise of 5. Between 09:00 and 12:00 it rose by only 4. Between 15:00 and 18:00 it changed by 5 degrees, but it fell rather than rose.
4	D	2 kg is 2,000 g, so change every mass to grams: B is 1,400 g and D is 500 g. Parcels A and C make 750 + 1250 = 2000 g. B and D make 1400 + 500 = 1900 g, B and E make 2,300 g, C and D make 1,750 g and A and E make 1,650 g.
5	B	When two straight lines cross, the angles opposite each other are equal. Angle c is opposite angle a, so they are the same size. Angles b and d sit next to a on a straight line, so each adds to a to make 180°.
6	E	Pages 1 to 9 each have one digit, which is 9 digits. Pages 10 to 20 are 11 pages with two digits each, which is 11 × 2 = 22 digits. Altogether that is 9 + 22 = 31 digits.
7	B	A prime number has exactly two factors, 1 and itself. 23 and 29 are prime. The others are not, because 3 × 7 = 21, 5 × 5 = 25 and 3 × 9 = 27. So 2 of the numbers are prime.
8	A	The y-coordinate is how far up a point is. A is at (1, 4) and C is at (5, 4), so both are 4 up. D is 5 up, B is 2 up and E is 1 up.

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9	E	A ratio stays the same when both numbers are multiplied by the same number. 4 : 6, 6 : 9, 10 : 15 and 20 : 30 are 2 : 3 multiplied by 2, 3, 5 and 10. For 8 : 10 the 2 has been multiplied by 4 but the 3 has not, since 3 × 4 = 12, so 8 : 10 is a different ratio.
10	A	Ali runs 100 ÷ 20 = 5 metres each second. Ben runs 200 ÷ 50 = 4 metres each second. So Ali is faster, by 5 − 4 = 1 metre every second. Ben runs further, but he also takes longer.
11	D	3.4 million is 3,400,000. Dividing by 1,000 gives 3400000 ÷ 1000 = 3400, so there are 3,400 thousands. Another way: a million is a thousand thousands, so 3.4 million is 3.4 × 1,000 thousands.
12	B	MATHEMATICS has 11 letters, so there are 11 cards. The vowels are A, E, A and I, which is 4 cards, because A appears twice. The probability is 4/11. 3/11 counts A only once, and 4/7 compares vowels with consonants instead of with all the cards.
13	C	The square runs from 2 to 5 across and from 1 to 4 up. Strictly inside it, the x-coordinate can be 3 or 4 and the y-coordinate can be 2 or 3. That gives 2 × 2 = 4 points: (3, 2), (3, 3), (4, 2) and (4, 3). Counting the edges as well would give 4 × 4 = 16 points.
14	D	1.35 kg is 1,350 g. Taking off the bag leaves 1350 − 50 = 1300 g of apples. Each apple is 130 g, so there are 1300 ÷ 130 = 10 apples.
15	C	The garden is 7 m by 7 m, because 7 × 7 = 49. All the way round is 4 × 7 = 28 m. The gate gap needs no fence, so the fencing is 28 − 1 = 27 m.
16	A	The hundredths digit of 0.96 is 6, which is 5 or more, so the 9 tenths round up to 10 tenths. Ten tenths make one whole, so the answer is 1.0. Ella wrote the 10 tenths after the decimal point, but 0.10 is only one tenth.
17	B	The car covers 500 ÷ 20 = 25 metres every second. An hour has 3,600 seconds, so in an hour it would go 25 × 3600 = 90000 m. That is 90000 ÷ 1000 = 90 km, so its speed is 90 km/h.

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18	E	Where a straight line crosses two parallel lines, every angle it makes is one of just two sizes: a larger angle and a smaller one, which add up to 180°. Angle a is one of the larger ones and angle c is one of the smaller ones, so a + c = 180°. The other pairs are two larger angles or two smaller angles, which are equal to each other and so cannot add up to 180°.
19	B	The point halfway between −4 and 0 is −2. Numbers below −2 are closer to −4, and numbers above −2 are closer to 0. −2.5 is 1.5 away from −4 but 2.5 away from 0, so it is closer to −4. −2 is exactly halfway, and −1.5, 1 and 2 are all closer to 0.
20	C	Call chapter 1 one part. Chapter 2 is 2 parts and chapter 3 is 2 parts and 10 pages, so 5 parts and 10 pages make 210. Then 5 parts are 210 − 10 = 200 pages and one part is 200 ÷ 5 = 40 pages. Chapter 3 is 2 × 40 + 10 = 90 pages.
21	A	Factors come in pairs that multiply to make the number: 1 pairs with the number itself. 3 × 8 = 24 and 4 × 6 = 24, so the number is 24, and its eighth factor is 24. 12 cannot be the number, because 8 is not a factor of 12, and 48 has other factors too, such as 16.
22	D	The tree's shadow is 12 ÷ 2 = 6 times as long as the stick's, so the tree is 6 times as tall as the stick: 1.5 × 6 = 9 m. Taking 0.5 m off the shadow, to give 11.5 m, adds or subtracts instead of multiplying.
23	E	Both parts are lots of 15: 16 lots take away 6 lots leaves 10 lots, and 15 × 10 = 150. Working it out in full gives the same: 15 × 16 = 240, 15 × 6 = 90 and 240 − 90 = 150.
24	A	Write both fractions in sixths: 1/2 is 3/6 and 1/3 is 2/6, so 3/6 + 2/6 = 5/6. To make 1, add 1 − 5/6 = 1/6. The answer 1/5 comes from adding the tops and the bottoms, which is not how fractions add.
25	C	The four digits are all the same at 00:00, 11:11 and 22:22. Four 3s or four 4s cannot make a time, because the hours only go up to 23. So it happens 3 times a day.

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26	D	3b is 3 × 8 = 24, so 2a is 24 as well, which makes a = 24 ÷ 2 = 12. Then a + b = 12 + 8 = 20. The answer 32 comes from taking a to be 24, forgetting that 24 is 2a, not a.
27	B	Class A has two and a half symbols for 30 books, so one symbol stands for 30 ÷ 2.5 = 12 books. Class C has 4 symbols, which is 4 × 12 = 48 books.
28	E	A fraction equivalent to 3/4 has 3 parts on top for every 4 parts underneath, which is 7 parts together. 35 ÷ 7 = 5, so the numerator is 3 × 5 = 15 and the denominator is 4 × 5 = 20. Checking: 15 + 20 = 35, and 15/20 simplifies to 3/4. 12/16 and 18/24 are equivalent to 3/4 but add to 28 and 42.
29	A	Draw the two lines joining opposite midpoints of the big square. They cut it into 4 equal small squares, and a side of the inner square cuts each small square exactly in half along its diagonal. So the inner square is made of 4 halves, which is half of the big square, and 50 ÷ 2 = 25 cm².
30	E	The number is 13 lots of 8 and 5 more. 13 × 8 = 104 and 104 + 5 = 109. Dividing 109 by 4: 27 × 4 = 108, which leaves 1, so the answer is 27 remainder 1. A remainder of 5 cannot be right when dividing by 4.
31	C	An hour has 60 × 60 = 3600 seconds, a day has 3600 × 24 = 86400 seconds and a week has 86400 × 7 = 604800 seconds. That is closest to 600,000.
32	D	There are 3 + 5 + 2 = 10 counters. 5 are blue and the other 5 are not, so blue and not blue each have a probability of 5/10, which is a half. Red (3/10) is more likely than green (2/10), but not twice as likely, and blue is more likely than red.
33	B	If a third of the boys equals a half of the girls, then for every 3 boys there are 2 girls: 3 boys give 1 in their third, and 2 girls give 1 in their half. So boys and girls are in the ratio 3 : 2, which is 5 parts. 30 ÷ 5 = 6, so there are 3 × 6 = 18 boys and 2 × 6 = 12 girls. Checking: a third of 18 is 6 and a half of 12 is 6.
34	E	Work backwards, undoing each step. Before the second use: 38 + 4 = 42 and 42 ÷ 3 = 14. Before the first use: 14 + 4 = 18 and 18 ÷ 3 = 6. Checking forwards: 6 × 3 − 4 = 14 and 14 × 3 − 4 = 38. The answer 14 undoes only one use of the rule.

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35	B	The diagonals of a square are equal in length, cross at right angles and cut each other in half. The diagonal from (1, 1) to (5, 5) has its midpoint at (3, 3). The other diagonal passes through (3, 3) at right angles and goes 2 across and 2 up or down each way, reaching (1, 5) and (5, 1). Joining the four corners makes a square with sides of 4.
36	D	Group the numbers in pairs: (1 − 2), (3 − 4), (5 − 6) and so on up to (99 − 100). Each pair is one less than zero, which is −1. There are 100 ÷ 2 = 50 pairs, so the total is 50 lots of −1, which is −50.
37	E	The visitors add up to 20 + 35 + 25 + 40 + 30 = 150, and 150 ÷ 5 = 30, so the mean is 30 visitors a day. Friday's bar is at 30. Wednesday is the middle day of the week, and its 25 is neither the mean nor the median, which is 30 as well.
38	A	Adding the three totals counts each child twice: 17 + 21 + 18 = 56, so the three children have 56 ÷ 2 = 28 marbles. Ann and Bo have 17 of them, so Cy has 28 − 17 = 11. Ann has 7 and Bo has 10, and 7 + 11 = 18 checks.
39	C	Try the values in turn. When x is 2, 2x − 1 is 3, which is not bigger than 3. When x is 3, 4 and 5, 2x − 1 is 5, 7 and 9, which all fit. When x is 6, 2x − 1 is 11, which is not smaller than 11. So x can be 3, 4 or 5, which is 3 values.
40	D	Emptying the pond takes 3 × 40 = 120 minutes of pump work. In the first 10 minutes three pumps do 3 × 10 = 30 minutes of it, leaving 120 − 30 = 90. Two pumps do that in 90 ÷ 2 = 45 minutes, so the whole job takes 10 + 45 = 55 minutes.
41	C	The third side must match one of the others, so the sides are 4, 4 and 9 or 4, 9 and 9. But 4 + 4 = 8, which is shorter than 9, so two 4 cm sides could not meet around a 9 cm side and that triangle cannot be drawn. The sides must be 4, 9 and 9, so the perimeter is 4 + 9 + 9 = 22 cm.
42	B	180 miles needs 180 ÷ 45 = 4 gallons. Each gallon is about 4.5 litres, so that is 4 × 4.5 = 18 litres. The answer 4 is the number of gallons, not litres.

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43	E	Each is compared with 1. 1.058 is 0.058 more than 1, and 1.085 is 0.085 more. 0.851 is 1 − 0.851 = 0.149 less than 1, and 0.815 is 0.185 less. 10.58 is nearly 10 away. The closest is 1.058, even though 0.851 starts with the same 0.8 as a number just under 1.
44	C	A whole number is rounded down to the nearest 10 when its ones digit is 4 or less, so the real number can be up to 4 more than the rounded one: 44 rounds down to 40, but 45 would round up to 50. Each of the eight numbers can be 4 more, so the real total can be up to 8 × 4 = 32 more than 400, which is 400 + 32 = 432.
45	A	In 12 hours it strikes 1 + 2 + 3 + … + 12 times. Pairing 1 with 12, 2 with 11 and so on gives 6 pairs of 13, and 13 × 6 = 78. It does this twice a day, so 78 × 2 = 156 strikes.
46	E	Every second Ali gets 6 − 5 = 1 metre further ahead. To be a whole lap, 400 m, ahead takes 400 ÷ 1 = 400 seconds. 400 seconds is 6 × 60 = 360 seconds and 40 more, which is 6 minutes 40 seconds.
47	D	17 × 30 = 510, which is too big. One lot of 17 fewer is 510 − 17 = 493, so 17 × 29 = 493, which is less than 500. The largest n is 29.
48	A	Two walls are 5 m by 2.5 m and two are 4 m by 2.5 m. Their areas are 5 × 2.5 = 12.5 and 4 × 2.5 = 10, so the four walls make 12.5 + 12.5 + 10 + 10 = 45 m². 45 ÷ 10 = 4.5, and part of a tin cannot be bought, so 5 tins are needed. The answer 2 is the floor, not the walls.
49	B	The smallest three-digit multiple of 25 is 100, which is 25 × 4, and the largest is 975, which is 25 × 39. So the multiples run from 4 lots of 25 up to 39 lots, which is 39 − 4 + 1 = 36 numbers. Forgetting to add the 1 gives 35.
50	C	Both rose by £10, but a percentage increase compares the rise with the amount at the start. For Amy, 10 ÷ 40 = 0.25, which is 25%. For Ben, 10 ÷ 50 = 0.2, which is 20%. Comparing Ben's £10 with his new total of £60 gives about 16.7% and is the trap.

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