Maths Mock Test Paper 29 Answers

Q#	Answer	Explanation
1	E	45 metres is 45 ÷ 3 = 15 lots of 3 metres. Each lot takes 2 seconds, so the lift takes 15 × 2 = 30 seconds. 15 seconds forgets that each 3 metres takes 2 seconds, not 1.
2	B	8 full boxes hold 6 × 8 = 48 eggs, which leaves 50 − 48 = 2 eggs in the next box. That box needs 6 − 2 = 4 more eggs to be full. 2 is the number of eggs already in it.
3	A	3a means 3 × a. So 3a − 1 is 3 × 7 − 1 = 20. The others are 2 × 7 + 4 = 18, 4 × 7 − 6 = 22, 7 + 14 = 21 and 5 × 7 − 16 = 19.
4	B	12 squares can make a 12 by 1, a 6 by 2 or a 4 by 3 rectangle. Their perimeters are 12 + 1 + 12 + 1 = 26 cm, 6 + 2 + 6 + 2 = 16 cm and 4 + 3 + 4 + 3 = 14 cm. So the rectangle is 4 cm by 3 cm, and its longer side is 4 cm.
5	A	Change everything to millilitres. The bottle holds 2,000 ml and the jug 1,800 ml. 3 cans hold 3 × 330 = 990 ml, 5 cups hold 5 × 450 = 2250 ml and 8 glasses hold 8 × 240 = 1920 ml. The 5 cups hold the most.
6	E	To round to a whole number, look at the tenths digit. 6.5 has a 5, so it rounds up to 7. 7.49 has a 4, so it rounds down to 7 as well. 6.49 and 6.05 round down to 6, 5.99 rounds up to 6, and 7.5 rounds up to 8.
7	C	A prime number has no factors except 1 and itself. 3 × 17 = 51, so 3 and 17 are factors of 51 and it is not prime. The others do not make 51: 5 × 11 = 55, 7 × 7 = 49, 2 × 25 = 50 and 4 × 13 = 52.
8	A	0.3 of 100 squares is 30 squares, and 25% of 100 squares is 25 squares. That makes 30 + 25 = 55 shaded squares, so 100 − 55 = 45 squares are not shaded. 55 is the number that are shaded.

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9	E	The spinner only has the numbers 1 to 6 on it, so it can never land on 7: that is impossible. Landing on a number less than 7 is certain, because every number on it is less than 7. Even numbers, odd numbers and multiples of 3 are all on the spinner, so each of those could happen.
10	D	D is at (1, 3): its x-coordinate is 1 and its y-coordinate is 3, which is 2 more. A is at (3, 1), where it is the x-coordinate that is 2 more. B is (2, 2), C is (4, 5) and E is (0, 4).
11	B	The numbers must be close to each other, and $6 \times 6 \times 6 = 216$ is close to 210, so try numbers around 6. $5 \times 6 \times 7 = 210$, which works. Their sum is $5 + 6 + 7 = 18$.
12	D	Start with r and work up. q is $2 \times 4 = 8$, and p is $3 \times 8 = 24$. So $p + q + r$ is $24 + 8 + 4 = 36$. The answer 24 is p on its own.
13	D	The mean is the total shared equally between the three games, so the highest total gives the highest mean. The totals are Ann $5 + 7 + 9 = 21$, Bo $8 + 8 + 5 = 21$, Cy $10 + 2 + 6 = 18$, Dee $6 + 9 + 7 = 22$ and Ed $4 + 11 + 6 = 21$. Dee's total of 22 is the highest. Ed has the highest single score, and Cy the highest first game, but neither has the highest mean.
14	C	Each of the 3 starters can go with any of the 4 main courses, giving $3 \times 4 = 12$ pairs. Each pair can go with either of the 2 desserts, giving $12 \times 2 = 24$ meals. Adding $3 + 4 + 2 = 9$ counts the dishes, not the meals.
15	D	P is at $(-2, 1)$ and Q is at $(4, 1)$, so side PQ is 6 units long. The area is 24, so the other side must be $24 \div 6 = 4$ units, straight up or down from P and Q. That puts the other corners at $(-2, 5)$ and $(4, 5)$, or at $(-2, -3)$ and $(4, -3)$. Of the options, only $(4, 5)$ is one of these.
16	B	To the nearest hundred, the tens digit decides. The smallest whole number that rounds up to 3,000 is 2,950, and the largest that rounds down to it is 3,049, since 3,050 rounds up to 3,100. From 2,950 to 3,049 there are $3049 - 2950 + 1 = 100$ whole numbers.

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17	E	Each rectangle is as long as the square's side and half as wide, so its perimeter is two whole sides and two half sides, which is three sides of the square. Three sides are 30 cm, so a side is 10 cm. Checking: the rectangle is 10 cm by 5 cm, and 10 + 5 + 10 + 5 = 30. The square's area is 10 × 10 = 100 cm².
18	A	Every 9 sweets include 2 red ones. 14 red sweets is 14 ÷ 2 = 7 lots of 2, so the bag has 7 lots of 9, which is 9 × 7 = 63 sweets. The sweets that are not red number 63 − 14 = 49. 63 is the whole bag.
19	B	5 tenths is 0.5, and 2.97 + 0.5 = 3.47. The tenths column goes past 9, so it carries into the ones. 3.02 adds 5 hundredths instead, 2.975 adds 5 thousandths, and 7.97 adds 5 ones.
20	D	A quarter turn is 90° and a half turn is 180°, so the three turns make 90 + 180 + 90 = 360°. A turn of 360° is a full turn, which leaves the shape exactly where it started.
21	A	1 minute 30 seconds is 1.5 minutes, and an hour is 60 minutes, which is 60 ÷ 1.5 = 40 lots of 1.5 minutes. So in an hour the car would go 40 miles, a speed of 40 mph. That is over the 30 mph limit by 40 − 30 = 10 mph.
22	C	Write each one as a decimal: 1/4 is 0.25 and 30% is 0.3. So the total is 0.2 + 0.25 + 0.3 = 0.75.
23	E	Pairing −8 with 6 gives −2, and pairing −3 with 1 also gives −2, so both pairs match. The other ways do not: −8 with 1 gives −7 while 6 with −3 gives 3, and −8 with −3 gives −11 while 6 with 1 gives 7.
24	D	One eighth of 48 litres is 48 ÷ 8 = 6 litres, so the tank holds 3 × 6 = 18 litres now. To fill it needs the other 5 eighths, which is 5 × 6 = 30 litres. 18 litres is how much is already in the tank.
25	C	36 = 6 × 6 and 64 = 8 × 8, so both are square numbers, and 36 + 64 = 100. In each of the other pairs, at least one number is not a square: 75, 51, 84 and 50 are not square numbers.

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26	B	Cutting a log into 6 pieces needs only 5 cuts, so each cut takes 10 ÷ 5 = 2 minutes. 12 pieces need 11 cuts, which take 11 × 2 = 22 minutes. Doubling the time to 20 minutes forgets that the number of cuts is one less than the number of pieces.
27	A	1 hour 12 minutes is 72 minutes. Playing 1.5 times as fast gets through the video in less time, so divide: 72 ÷ 1.5 = 48 minutes. Multiplying, to get 1 hour 48 minutes, would be watching it more slowly.
28	E	The wall, the ground and the ladder make a triangle. The wall meets the ground at a right angle, 90°, and the ladder meets the ground at 70°. The angles of a triangle add up to 180°, so the angle at the wall is 180 − 90 − 70 = 20°.
29	D	An hour is 3,600 seconds, and two hours are 7,200 seconds, leaving 10000 − 7200 = 2800 seconds. 46 minutes is 46 × 60 = 2760 seconds, leaving 2800 − 2760 = 40 seconds. So 10,000 seconds is 2 hours 46 minutes 40 seconds. 1 hour 40 minutes treats 10,000 seconds as if it were 100 minutes.
30	C	8p is 3 + 5, 9p is 3 + 3 + 3 and 10p is 5 + 5. Once three amounts in a row can be made, adding another 3p stamp makes every amount after them too. 7p cannot be made: one 5p leaves 2p and two 3p stamps leave 1p. So the largest amount that cannot be made is 7p.
31	B	A pentagon splits into 3 triangles, so its angles add up to 3 × 180 = 540°. The three right angles use 3 × 90 = 270°, leaving 540 − 270 = 270° for the other two. Each one is 270 ÷ 2 = 135°. 108° is each angle of a regular pentagon.
32	A	Each term is double the one before, with 8 added: double −5 is −10, and adding 8 gives −2. Double 16 is 32 and adding 8 gives 40. So the next term is 40 × 2 + 8 = 88. The gaps 3, 6, 12 and 24 also double each time, so the next gap is 48, and 40 + 48 = 88 as well.
33	E	Whenever Amy walks 3 km, Ben walks 4 km, so together they close 3 + 4 = 7 km. The 21 km gap is 21 ÷ 7 = 3 lots of that, so Amy walks 3 × 3 = 9 km and Ben walks 3 × 4 = 12 km. Checking: 9 + 12 = 21.

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34	D	There are 5 odd digits: 1, 3, 5, 7 and 9. The hundreds digit can be any of the 5, the tens digit any of the 5 and the ones digit any of the 5. That gives 5 × 5 × 5 = 125 numbers. 450 is the number of three-digit numbers that are odd.
35	C	The factors of 28 other than 28 are 1, 2, 4, 7 and 14, and 1 + 2 + 4 + 7 + 14 = 28, so 28 is perfect. For 12 they are 1, 2, 3, 4 and 6, which add up to 1 + 2 + 3 + 4 + 6 = 16, which is too many. 18, 24 and 30 also have factors adding up to more than the number.
36	E	43 × 57 is estimated as 40 × 60 = 2400, but exactly it is 43 × 57 = 2451, so the estimate is too small. The others are all too big: 38 × 62 = 2356, 36 × 64 = 2304 and 38 × 58 = 2204 are each less than 2,400, and 45 × 55 = 2475 is less than its estimate of 50 × 60 = 3000.
37	A	999 × 999 is 999 × 1000 with one 999 taken away. 999 × 1000 = 999000, and 999000 − 999 = 998001, so the answer is 998,001.
38	B	Forward 2 facing up takes it to (0, 2). Turning right, it faces along the x-axis to the right, and forward 3 takes it to (3, 2). Turning right again, it faces down, and forward 1 takes it to (3, 1).
39	C	The corner cube had 3 faces on the outside, and those 3 faces disappear. But taking it away uncovers 3 faces of the cubes that were touching it, which are now on the outside instead. 3 faces lost and 3 faces gained leave the surface area exactly the same.
40	A	A roll is 150 cm. Two pieces use 2 × 55 = 110 cm, but three would need 3 × 55 = 165 cm, which is too long. So each roll gives only 2 pieces, and 8 pieces need 8 ÷ 2 = 4 rolls. Working out 8 × 55 = 440 cm and sharing it into 150 cm rolls suggests 3 rolls, but that forgets the offcuts too short to use.
41	E	The digits come in blocks of six. Three blocks use 3 × 6 = 18 digits, so the 18th digit is the 7 at the end of a block. The 19th digit starts a new block with 1, and the 20th digit is 4.

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42	C	The first week ends on Friday 6 September, and 14 more weeks is 14 × 7 = 98 days after that. September has 24 days left after the 6th, October has 31 and November has 30, which use up 24 + 31 + 30 = 85 days. That leaves 98 − 85 = 13 days into December, so the term finishes on Friday 13 December.
43	B	Adding the odd numbers from 1 always makes a square number, and the square matches how many odd numbers are added. The odd numbers from 1 to 29 are 1, 3, 5 and so on, which is 15 numbers, because 29 is the 15th odd number. So the total is 15 × 15 = 225.
44	D	A prism has two matching end faces joined by rectangles. If each end has n sides, there are n edges round each end and n edges joining the ends, which is 3n edges. 3n is 18, so n is 6: the ends are hexagons. The faces are the 2 ends and 6 rectangles, which is 6 + 2 = 8 faces.
45	C	The metal has 18 + 6 = 24 parts in all. The ring weighs 6 g, so each part is 6 ÷ 24 = 0.25 g. The gold is 18 parts, which is 18 × 0.25 = 4.5 g. 1.5 g is the other metals.
46	A	There is no need to follow each trip of the fly. The cyclists close the gap at 12 + 8 = 20 km every hour, so the 20 km gap closes in exactly 1 hour. The fly flies for that whole hour at 30 km/h, so it travels 30 km.
47	D	There are 9 small squares. Squares 2 small squares wide can start in 2 positions across and 2 down, so there are 4 of them. There is 1 square 3 wide, the whole grid. Altogether that is 9 + 4 + 1 = 14 squares.
48	B	A two-digit number's digits add up to at most 9 + 9 = 18, so the number needs three digits. To keep it small, the hundreds digit must be as small as possible, which means the other two digits must be as big as possible: 9 and 9. Then the hundreds digit is 20 − 18 = 2, giving 299.
49	E	A mean of 14 for 10 marks means the total used was 10 × 14 = 140. The copied mark was 17 − 7 = 10 too big, so the real total is 140 − 10 = 130. The correct mean is 130 ÷ 10 = 13.

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50	C	Keep a running total. After Monday the level is 3 cm above normal. Tuesday's fall of 6 cm takes it to 3 cm below. Wednesday's fall of 2 cm takes it to 5 cm below, the lowest point. Thursday's rise of 4 cm brings it up to 1 cm below, and Friday leaves it 2 cm below. Tuesday had the biggest single fall, but the level kept falling on Wednesday.

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