

Coordinates & Graphs: Hard Practice Paper 6 Answers

Q#	Answer	Explanation
1	B	The two lines cross at (3, 5). To the left of that crossing the falling line is on top, and to the right of it $y = x + 2$ is on top, because it keeps climbing while the other keeps dropping. So $y = x + 2$ is higher when x is more than 3.
2	A	Going from (0, -3) to (2, 1) the line moves 2 across and climbs 4, so it climbs $4 \div 2 = 2$ for every 1 across. That gives $2x$. It crosses the y-axis at -3, so the equation is $y = 2x - 3$.
3	C	At the crossing point both rules give the same y , so $4x - 1$ must equal $x + 8$. Taking x from both sides leaves $3x - 1$ equal to 8, so $3x = 9$ and $x = 3$. Then y is $3 + 8 = 11$, giving (3, 11).
4	C	Reading the grid, the line crosses the y-axis at 1 and climbs 2 for every 1 across, so its equation is $y = 2x + 1$. Putting $x = 10$ into that gives $20 + 1 = 21$, so (10, 21) lies on it. None of the others fit the rule.
5	A	Parallel lines are equally steep, so this line must also climb 5 for each step across, giving $y = 5x + \text{something}$. At (1, 9) the $5x$ part is 5, and 9 is 4 more than that, so the equation is $y = 5x + 4$.
6	A	The line starts at 8 on the y-axis and has fallen to 0 by the time x reaches 4, so it drops $8 \div 4 = 2$ for every 1 across. A falling line takes the x term away from the starting value, giving $y = 8 - 2x$.
7	E	Put 30 in place of x in the rule: $3 \times 30 = 90$, and then $90 + 2 = 92$. That is exactly the y -coordinate given, so the point does lie on the line. A graph is not needed, because the rule settles it.
8	B	From (0, 1) to (6, 4) the line moves 6 across and climbs $4 - 1 = 3$. Sharing that climb over the 6 steps across gives $3 \div 6 = 0.5$, so it rises half a square for each one across.

9	C	The two lines cross at 5 hours. Before that the B line is the lower of the two, so Plan B costs less, and after it the B line is higher because it climbs more steeply. So Plan B is cheaper for fewer than 5 hours.
10	C	The plans charge the same where the lines cross, which is at 5 hours. Reading across from that point gives £20. Checking: Plan A is $10 + 5 \times 2 = 20$ and Plan B is $5 \times 4 = 20$.
11	B	Halfway between 2 and 6 across is 4, and halfway between 3 and 7 up is 5, so the midpoint is (4, 5). It should sit on the line as well, and $4 + 1 = 5$ shows that it does.
12	A	The y values do not go up by the same amount each time, since the steps are 3, 5 and 7, so the rule is not a straight line. Each y is its own x multiplied by itself, because $3 \times 3 = 9$ and $4 \times 4 = 16$, so the rule is $y = x^2$.
13	D	For three points to lie on one line, the climb must keep pace with the steps across. From (0, 0) to (3, 3) the line climbs 3 in 3 across, but from (3, 3) to (6, 7) it climbs 4 in 3 across, so the direction changes and the points are not in line.
14	C	Over the 5 years the van loses $12000 - 2000 = 10000$ pounds. Because the graph is a straight line the loss is the same every year, so each year it loses $10000 \div 5 = 2000$ pounds.
15	A	The line starts at 7 on the y-axis, so the equation begins with 7. Because it falls rather than climbs, three lots of x are taken away as x grows, giving $y = 7 - 3x$. Checking at $x = 2$ gives $7 - 6 = 1$, which is 6 below the start, as expected.