Parallel and perpendicular lines

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Are $y = 3x + 2$ and $6x - 2y = 5$ parallel, perpendicular or neither? [2 marks]

The second is $y = 3x - 2.5$: same gradient, different intercept.

Answer: Parallel and distinct.

2. Find a line parallel to $y = -4x + 9$ through $(1, 2)$. [2 marks]

$y - 2 = -4(x - 1)$.

Answer: $y = -4x + 6$

3. Find a line perpendicular to $y = \frac{x}{3} - 2$ through $(2, 5)$. [2 marks]

Perpendicular gradient -3; $y - 5 = -3(x - 2)$.

Answer: $y = -3x + 11$

4. Find the line perpendicular to $y = 7$ through $(-2, 3)$. [2 marks]

The perpendicular to a horizontal line is vertical through the supplied x-coordinate.

Answer: $x = -2$

5. Determine whether the lines joining $(0, 0)$ to $(2, 6)$, and $(1, 4)$ to $(7, 2)$, are perpendicular. [2 marks]

The gradients are 3 and $\frac{-1}{3}$, whose product is -1.

Answer: Yes.

6. Two paths have equations $y = 2x + 5$ and $4x - 2y = -10$. Are they distinct parallel paths? [2 marks]

Rearranging the second gives $y = 2x + 5$ exactly.

Answer: No; they are the same line.