Finding a line from points or gradient

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Find the line of gradient 4 through $(2, 1)$. [2 marks]

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

Answer: $y = 4x - 7$

2. Find the line through $(-1, 2)$ and $(3, 10)$. [2 marks]

$\text{Gradient} = \frac{10-2}{3+1} = 2$.

Use $(-1, 2)$: $2 = -2 + c$, so $c = 4$.

Answer: $y = 2x + 4$

3. A line meets the axes at $(6, 0)$ and $(0, 3)$. Find its equation. [2 marks]

$\text{Gradient} = \frac{0-3}{6-0} = \frac{-1}{2}$ and the y-intercept is 3.

Answer: $y = \frac{-x}{2} + 3$

4. Find the equation through $(-4, 2)$ and $(-4, 9)$. [2 marks]

Both x-coordinates agree, so the line is vertical.

Answer: $x = -4$

5. A taxi fare is linear. A 2 km trip costs 11 dollars and a 7 km trip costs 23.50 dollars. Find a fare model. [2 marks]

$\text{Rate} = \frac{23.50-11}{7-2} = 2.50$ dollars/km.

Using $d = 2$ gives the initial fee 6 dollars.

Answer: $C(d) = 2.5d + 6$ for distances d in kilometres.

6. Does $y = 3x - 1$ pass through both $(2, 5)$ and $(4, 10)$? Explain. [2 marks]

At $x = 2$, $y = 5$; at $x = 4$, the rule gives 11 rather than 10.

Answer: It passes through $(2, 5)$ only.