Coordinate geometry

P1 | Study notes, worked example and practice

What to understand

The gradient measures the change in y divided by the change in x. Use a point and a gradient to form a line equation.

Parallel lines have equal gradients. Perpendicular non-vertical lines have gradients whose product is -1.

Key formulae

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y - y_1 = m(x - x_1), \qquad m_1 m_2 = -1$$

Worked example

$$\frac{10 - 2}{5 - 1} = 2$$

The gradient between (1, 2) and (5, 10) is 2.

Practice questions

Show your working. Try these without looking at the answers.

1. Find the gradient of the line through (1, 2) and (5, 10).

2. Find the equation of the line through (1, 2) perpendicular to $y = 2x + 3$.

3. Find the intersection of $y = 2x + 1$ and $y = -x + 7$.

Answers

Use these to check the method as well as the final answer.

1. 2.

2. $y - 2 = -\frac{1}{2}(x - 1)$.

3. (2, 5).