

## 10.6 Key Concepts 1 Equation of a Line Given Two Points Worked Example

**Example:** Find the equation of a line passing through the points  $(-1, 7)$  and  $(1, 3)$ .

**Solution:** Use the two points to find the slope from the relation  $m = \frac{y_2 - y_1}{x_2 - x_1}$ .

Substitute the slope and the coordinates of one of the points into  $y = mx + b$ . Then, solve for  $b$ .

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} & y &= mx + b \\ &= \frac{3 - 7}{1 - (-1)} & 7 &= -2(-1) + b \\ &= \frac{-4}{2} & 7 &= 2 + b \\ &= -2 & 7 - 2 &= 2 + b - 2 \\ & & 5 &= b \end{aligned}$$

The equation of the line is  $y = -2x + 5$ .

**Practice:**

1. Find the equation of a line passing through the points  $(-1, 8)$  and  $(1, 2)$ .

2. Find the equation of a line passing through the points  $(-2, -1)$  and  $(1, 1)$ .

Answers: 1.  $y = -3x + 5$ , 2.  $y = \frac{2}{3}x + \frac{1}{3}$