

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. $y = \frac{2}{3}x + \frac{1}{3}$