

CHAPTER 6 Analyse Linear Relations

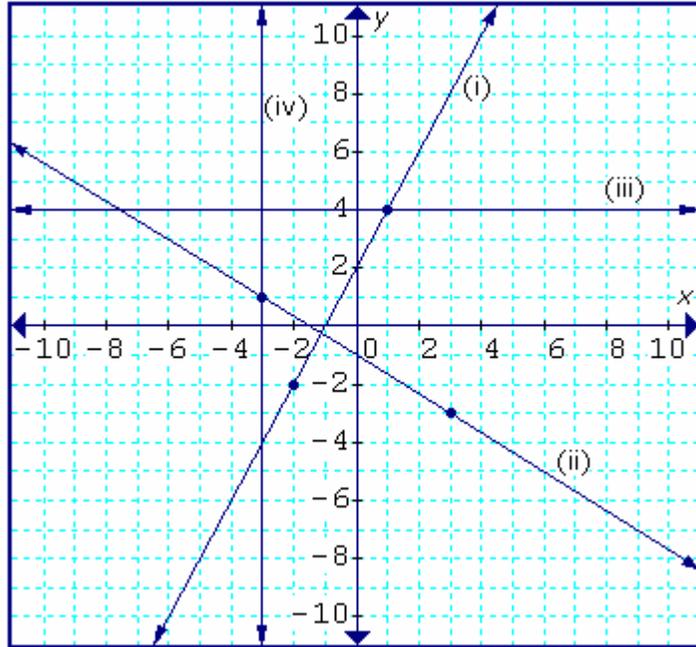
6.1 The Equation of a Line in Slope  $y$ -Intercept Form:  $y = mx + b$

The Equation of a Line in Slope  $y$ -Intercept Form:  $y = mx + b$

Vertical and Horizontal Lines

**Example:**

a) Identify the slope and the  $y$ -intercept for each of the relations shown. Then, write the equation of each line.



**Solution:**

To find the slope, use two points on the graph. Then, apply the slope formula. Read the  $y$ -intercept from the graph.

$$\begin{aligned} \text{a) (i) } m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{4 - (-2)}{1 - (-2)} \\ &= \frac{6}{3} \\ &= 2 \end{aligned}$$

$$b = 2$$

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

$$\begin{aligned}
 \text{(ii) } m &= \frac{y_2 - y_1}{x_2 - x_1} \\
 &= \frac{(-3) - 1}{3 - (-3)} \\
 &= \frac{-4}{6} \\
 &= -\frac{2}{3}
 \end{aligned}$$

$$b = -1$$

The equation of the line is  $y = -\frac{2}{3}x - 1$ .

(iii) The line is horizontal. The slope is 0.

The y-intercept is 4.

The equation of the line is  $y = 4$ .

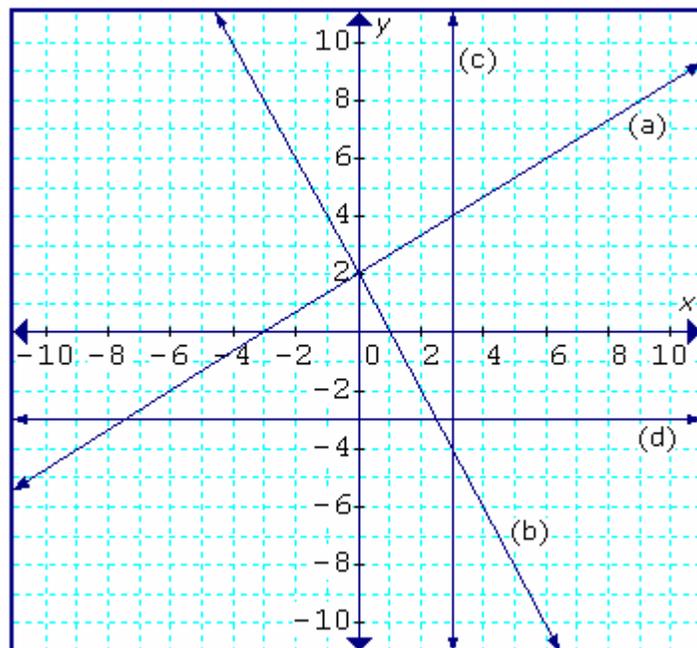
(iv) The line is vertical.

There is no y-intercept.

The equation of the line is  $x = -3$ .

### Practice:

1. Identify the slope and y-intercept for each of the relations shown. Then, write the equation of each line.



### Answers:

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

b)  $y = -2x + 2$

c)  $x = 3$

d)  $y = -3$