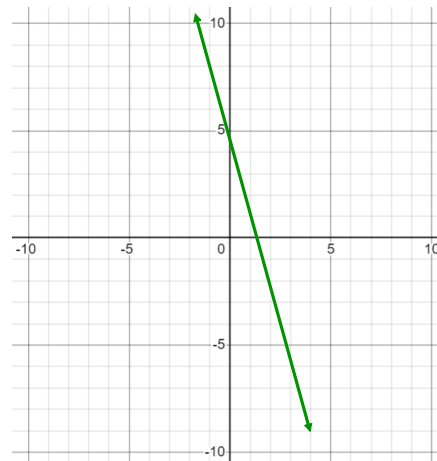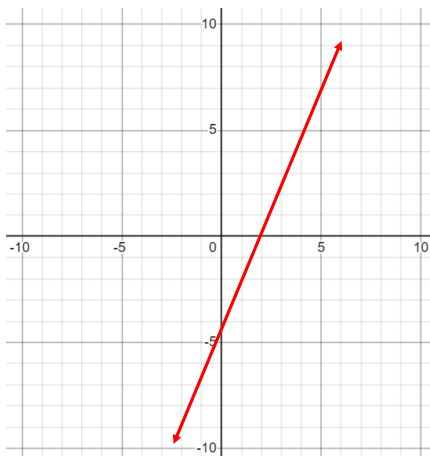# Solutions

Page 174 #s 2ab, 4ab, 6, 8bc, 9bc, 12ace, 13abc, 17, 22ade

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2. Sketch a graph of the line with the given slope and y-intercept.

a)   **Slope:** 2   b)   **Slope:** -3
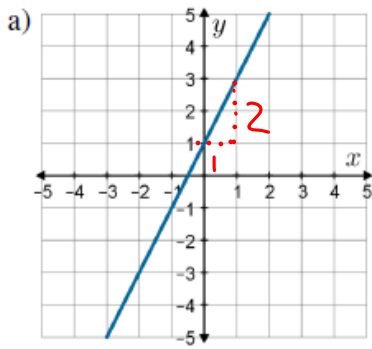   **y-intercept:** -4 **y-intercept:** 4

4. Write the equation of each line described in question #2 in $y = mx + b$ form.
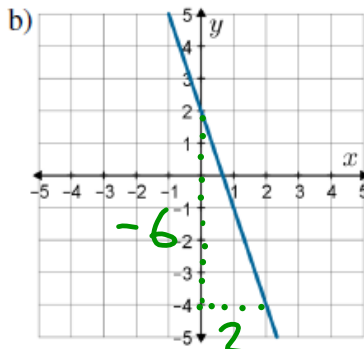
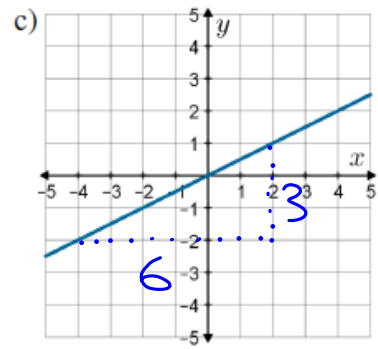a) $y = mx + b$
$y = 2x - 4$

b) $y = mx + b$
$y = -3x + 4$

6. For each of the following lines, state the slope and y-intercept and determine the equation of the line in $y = mx + b$ form.

a)

b)

c)

$$\text{Slope} = \frac{2}{1} = 2$$

$$y\text{-int} = 1$$

$$\Rightarrow y = 2x + 1$$

$$\text{Slope} = \frac{-6}{2} = -3$$

$$y\text{-int} = 2$$
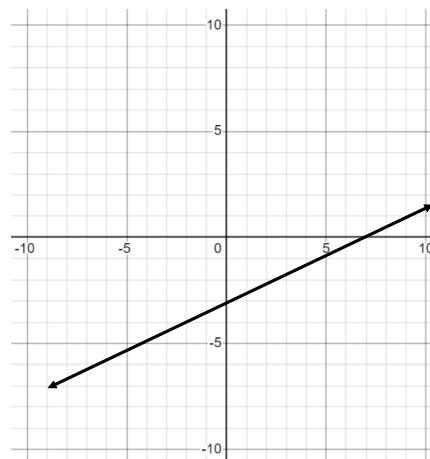
$$\Rightarrow y = -3x + 2$$

$$\text{Slope} = \frac{3}{6} = \frac{1}{2}$$

$$y\text{-int} = 0$$

$$\Rightarrow y = \frac{1}{2}x + 0$$

$$y = \frac{1}{2}x$$

8. Sketch a graph of the line with the given slope and y-intercept.
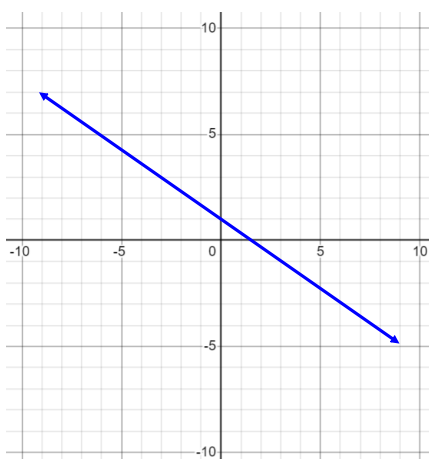
b) **Slope:** $-\dfrac{3}{4}$ c) **Slope:** $\dfrac{2}{5}$
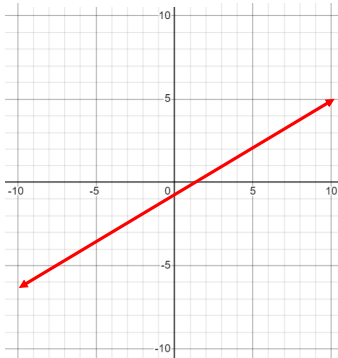
y-intercept: 1 y-intercept: -3

9. Write the equation of each line described in question #8 in $y = mx + b$ form.

b) $y = mx + b$

$y = -\frac{3}{4}x + 1$

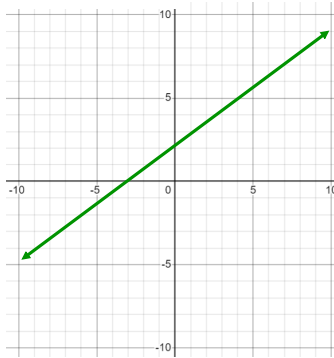c) $y = mx + b$

$y = \frac{2}{5}x - 3$

2

12. For each of the following lines, state the slope and y-intercept and sketch a graph of the line.
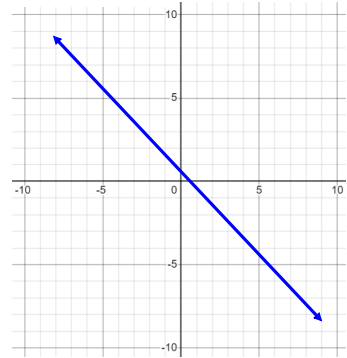
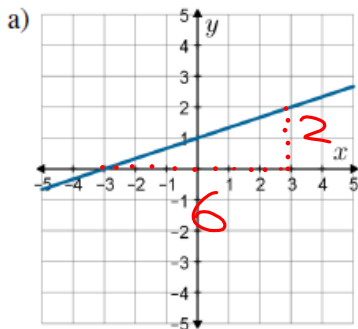a) $y = \dfrac{2}{3}x - 1$ c) $y = \dfrac{3}{4}x + 2$ e) $y = \dfrac{1}{2} - x$

Slope $= \dfrac{2}{3}$

y-int $= -1$

Slope $= \dfrac{3}{4}$
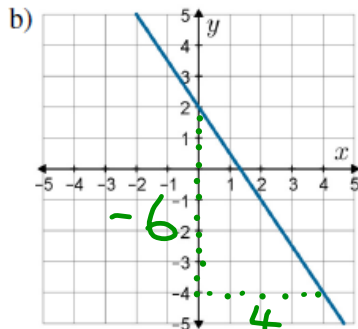
y-int $= 2$

Slope $= -1$

y-int $= \dfrac{1}{2}$

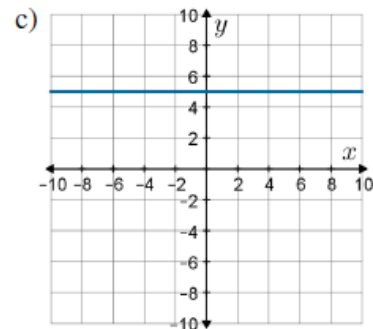**13.** For each of the following lines, state the slope and y-intercept and determine the equation of the line in $y = mx + b$ form.

a)   b)   c)

slope $= \dfrac{2}{6} = \dfrac{1}{3}$

y-int $= 1$

$\Rightarrow y = \dfrac{1}{3}x + 1$

Slope $= \dfrac{-6}{4} = \dfrac{-3}{2}$

y-int $= 2$

$\Rightarrow y = -\dfrac{3}{2}x + 2$

slope $= 0$

y-int $= 5$

$\Rightarrow y = 0x + 5$

$y = 5$

17. The point $(2, a)$ is on the line $y = 5x - 30$. Determine the value of a.

$$y = 5x - 30$$

Sub in $x = 2$ and $y = a$ $(2, a)$

                                          x-value   y-value

$$\Rightarrow \quad a = 5(2) - 30$$

$$a = 10 - 30$$

$$a = -20$$

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22. A line's x-intercept is the x-coordinate of the point where it crosses the x-axis.

   a) Determine the x-intercept of the line $y = -6x + 12$.

   d) Is it possible for a line to have no x-intercept? Explain.

   e) Is it possible for a line to have more than one x-intercept? Explain.

a) $y = -6x + 12$

x-intercept when it crosses x-axis

$$\Rightarrow y = 0$$

$$0 = -6x + 12$$

$$0 + 6x = -6x + 12 + 6x$$

$$\frac{6x}{6} = \frac{12}{6}$$

$$x = 2$$

$$\Rightarrow \text{x-int is } (2, 0)$$

d) No. It can always be extended to cross the x-axis.

e) No. Once it has the x-axis it can't go back on itself.

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