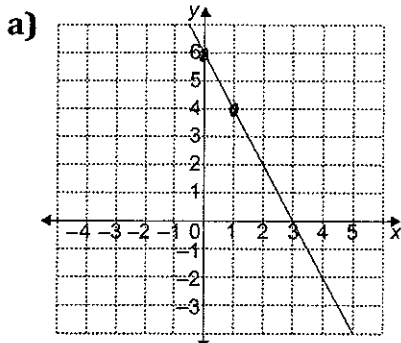# Chapter 6 Review

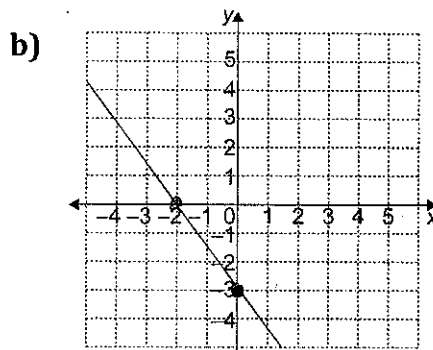**6.1 The Equation of a Line in Slope *y*-Intercept Form: $y = mx + b$, pages 296–307**

1. Find the slope and *y*-intercept of each line.
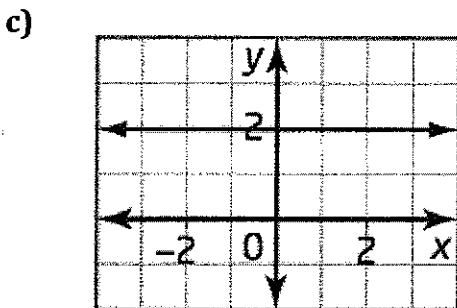
a)

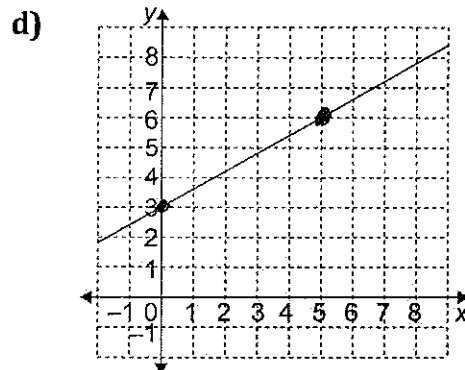$$m = \frac{-2}{1} = -2$$
$$b = 6$$

b)

$$m = \frac{-3}{2}$$
$$b = -3$$

c)

$$m = 0$$
$$b = 2$$

d)

$$m = \frac{3}{5}$$
$$b = 3$$

2. Identify the slope and *y*-intercept of each line.

a) $y = 4x - 5$

$$m = 4$$
$$b = -5$$

b) $y = -\frac{1}{6}x + 2$
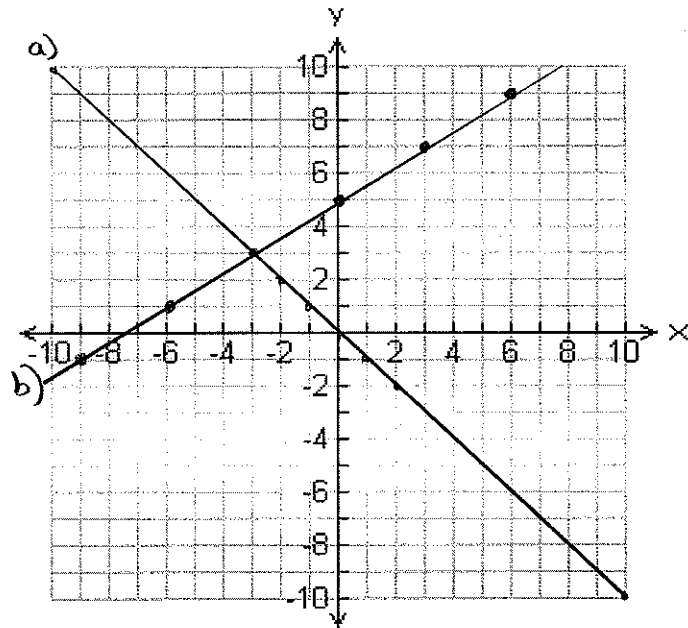
$$m = \frac{-1}{6}$$
$$b = 2$$

3. Write the equation of a line with each slope and *y*-intercept. Then, graph each line.

a) $m = -1, b = 0$

$$y = -x$$

b) $m = \frac{2}{3}, b = 5$

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

4. Frank recorded his motion with a motion sensor and produced this graph.
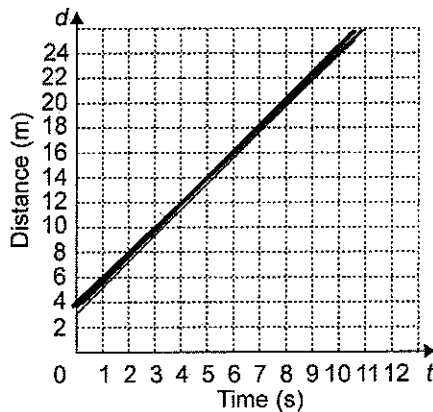
a) How far was Frank from the motion sensor when he started moving?

4 m.

b) Was Frank moving toward the motion sensor or away from it? How fast was he moving?

away at a speed of 2 m/s

c) Write an equation that describes this distance-time relationship.

$$y = 2x + 4$$

6.2 The Equation of a Line in Standard Form: $Ax + By + C = 0$, pages 308–314

5. Express each equation in the form $y = mx + b$. *(HINT: SOLVE THE EQUATION FOR 'y')*

a) $6x - y = 4$

$-y = -6x + 4$

$y = 6x - 4$

b) $x + 4y = 28$

$4y = -x + 28$

$y = -\frac{1}{4}x + 7$

c) $3x + 5y + 15 = 0$

$5y = -3x - 15$

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

6. Identify the slope and y-intercept of each equation.

a) $8x + y = 4$

$y = -8x + 4$

$m = -8$

$b = 4$

b) $-3x + 2y = 8$

$2y = 3x + 8$

$y = \frac{3}{2}x + 4$

$m = \frac{3}{2}$

$b = 4$

6.3 Graph a Line Using Intercepts, pages 315–322

7. Identify the x- and y-intercepts of each line. Then, graph the line all on the same grid (on the following page).

a) $4x - 2y = 8$

x-int

$4x - 2(0) = 8$

$4x = 8$

$x = 2$

$(2, 0)$

y-int

$4(0) - 2y = 8$

$-2y = 8$

$y = -4$

$(0, -4)$

b) $x + 3y = 6$

x-int

$x + 3(0) = 6$

$x = 6$

$(6, 0)$

y-int

$(0) + 3y = 6$

$3y = 6$

$y = 2$

$(0, 2)$

c) $2y + 2x = -16$

x-int

$2(0) + 2x = -16$

$2x = -16$

$x = -8$

$(-8, 0)$

y-int

$2y + 2(0) = -16$

$2y = -16$

$y = -8$

$(0, -8)$

d) $5x + 3y - 15 = 0$

x-int

$5x + 3(0) - 15 = 0$

$5x = 15$

$x = 3$

$(3, 0)$

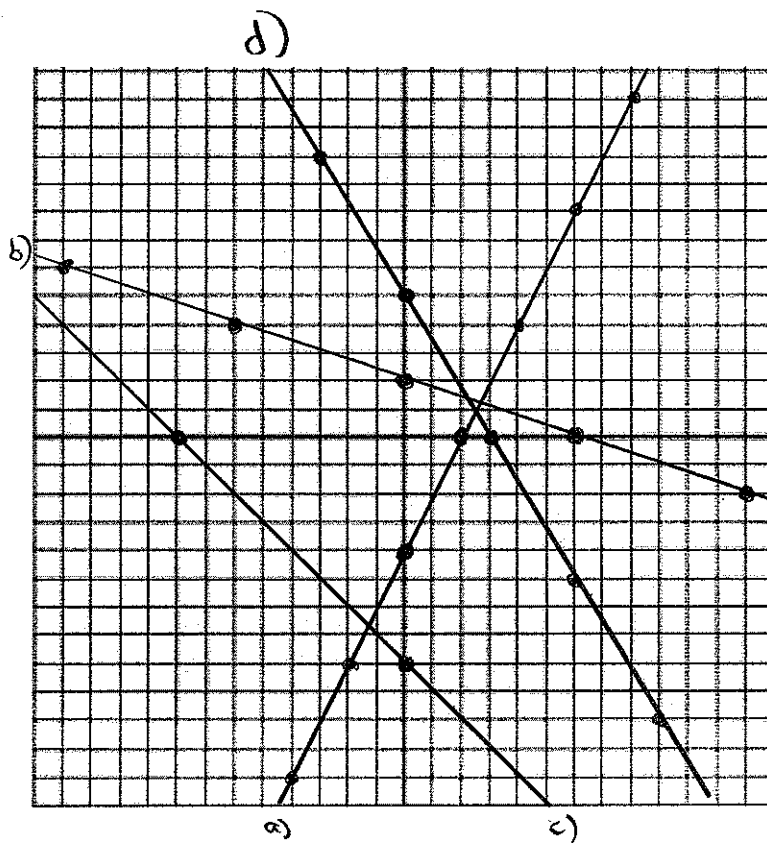y-int

$5(0) + 3y - 15 = 0$

$3y = 15$

$y = 5$

$(0, 5)$

d)

b)

a)

c)

6.4 Parallel and Perpendicular Lines, pages 326–329

8. Rearrange each of the following lines in to slope y-intercept form (y=mx+b)

a) $2x - 3y + 12 = 0$

$-3y = -2x - 12$

$y = \frac{2}{3}x + 4$

b) $3y = 2x + 6$

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

c) $3x - 2y = 0$

$-2y = -3x$

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

d) $3x + 2y = -4$

$2y = -3x - 4$

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

9. Which lines are parallel?

a) and b)

10. Which lines in question 7 are perpendicular?

a) and b) are perpedicular to d)

11. Write the slope that is perpendicular to each of the following slopes:

a) $m = \frac{1}{2}$

$\perp m = -2$

b) $m = -3$

$\perp m = \frac{1}{3}$

c) $m = \frac{-2}{5}$

$\perp m = \frac{5}{2}$

d) $m = 5$

$\perp m = \frac{-1}{5}$

12. What is the slope of a line that is perpendicular to $3 - x + 4y = 0$?

$4y = x - 3$

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

$\perp m = -4$

6.5 Find an Equation for a Line Given the Slope and a Point, pages 330–337

13. Find the equation of a line with a slope of $\overset{m}{-3}$, passing through $(\overset{x}{2}, \overset{y}{-5})$.

$y = mx + b$

$-5 = (-3)(2) + b$

$-5 = -6 + b$

$1 = b$

$\boxed{y = -3x + 1}$

14. Find the equation of a line with a slope of $\overset{m}{\frac{2}{3}}$ passing through $(\overset{x}{1}, \overset{y}{-4})$

$y = mx + b$

$-4 = (\frac{2}{3})(1) + b$

$-4 = \frac{2}{3} + b$

$-\frac{12}{3} - \frac{2}{3} = b$

$-\frac{14}{3} = b$

$y = \frac{2}{3}x - \frac{14}{3}$

15. Find the equation of a line parallel to $2x + 5y = 1$, with the same y-intercept as $x - 4y = 8$.

slope

$5y = -2x + 1$

$y = -\frac{2}{5}x + \frac{1}{5}$

$m = -\frac{2}{5}$

y-int

$-4y = -x + 8$

$y = \frac{1}{4}x - 2$

$b = -2$

$y = mx + b$

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

16. Find the equation for a line perpendicular to $y = 2x - 3$, that passes through the origin $(0,0)$.

$\perp m = -\frac{1}{2}$

$b = 0$

$y = mx + b$

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

6.6 Find an Equation for a Line Given Two Points, pages 338–343

17. Find the equation for a line passing through $(3, -4)$ and $(2, 5)$.

$m = \dfrac{5 - (-4)}{2 - 3}$

$= \dfrac{9}{-1}$

$= -9$

$y = mx + b$

$5 = (-9)(2) + b$

$5 = -18 + b$

$23 = b$

$\boxed{y = -9x + 23}$

18. Find an equation for a line passing through $(-2, 5)$ and $(3, -5)$

$m = \dfrac{-5 - 5}{3 - (-2)}$

$= \dfrac{-10}{5}$

$= -2$

$y = mx + b$

$5 = (-2)(-2) + b$

$5 = 4 + b$

$1 = b$

$\boxed{y = -2x + 1}$

$$\overset{x_1 \quad y_1}{(1, 3.9)} \qquad\qquad \overset{x_2 \quad y_2}{(3, 1.7)}$$

19. Ingrid is walking in front of a motion sensor. After 1 s, she is 3.9 m from the sensor. After 3 s, she is 1.7 m from the sensor.

a) Find the slope for this relationship.

$$m = \frac{1.7 - 3.9}{3 - 1}$$

$$= \frac{-2.2}{2}$$

$$= -1.1$$

b) Write an equation of the form $d = mt + b$ that describes Ingrid's motion.

$$1.7 = (-1.1)(3) + b$$
$$1.7 = -3.3 + b$$
$$5 = b$$

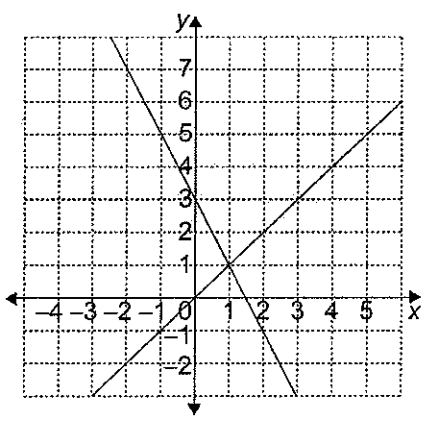$$\boxed{\begin{array}{c} y = -1.1x + 5 \\ or \\ d = -1.1t + 5 \end{array}}$$

c) After how many seconds will Ingrid's distance from the motion sensor be 0?

$$0 = -1.1t + 5$$
$$-5 = -1.1t$$

$$\frac{-5}{-1.1} = t$$

$$t = 4.5 \text{ seconds}$$

6.7 Linear Systems, pages 344–351
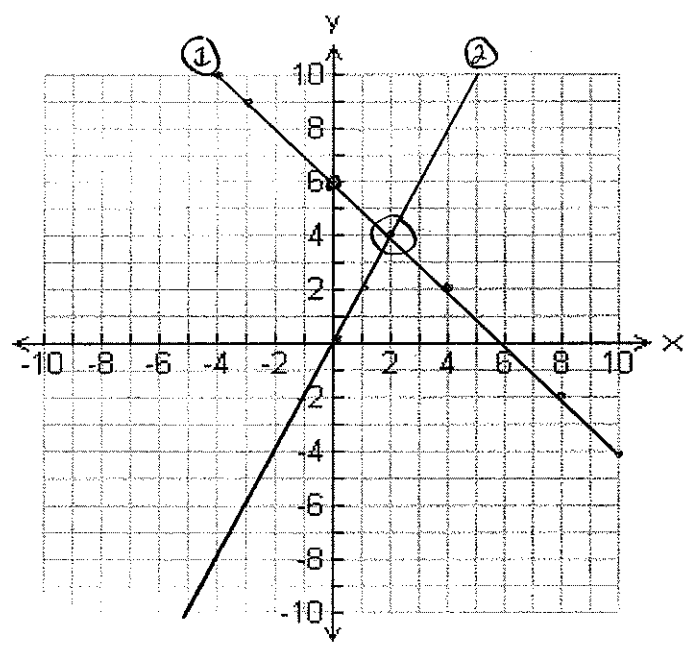
20. What is the solution to this linear system?

POI is $(1,1)$

21. Solve the linear system $x + y = 6$ and $y - 2x = 0$.

① $y = -x + 6$

② $y = 2x$

POI is $(2,4)$

Vertical and Horizontal Lines

22. Fill in the following blanks:

a) In general, a horizontal line has a slope that is ___zero___ and an equation of the form ___$y=b$___ where 'b' is the ___y-intercept___.

b) In general, a vertical line has a slope that is ___undefined___ and an equation of the form ___$x=a$___ where 'a' is the ___x-intercept___.
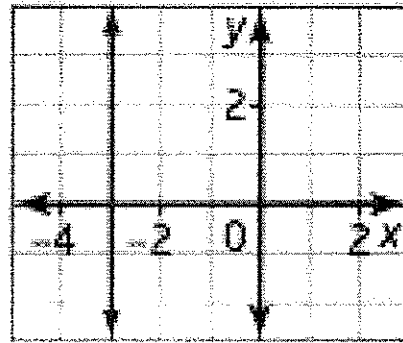
23. What are the slope, y-intercept and equation of each of the following lines
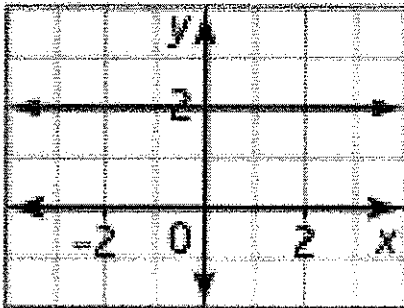
Equation: $y=2$

Slope: 0

y-intercept: 2

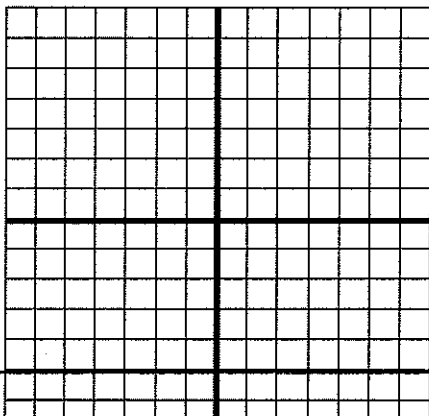

Equation: $x=-3$

Slope: undefined

y-interc none

24. Find the slope and *y*-intercept of each line, if they exist. Graph each line.

a) $y = -5$

slope: 0

y-intercept: -5

b) $x = 4$

slope: undefined

y-intercept: none