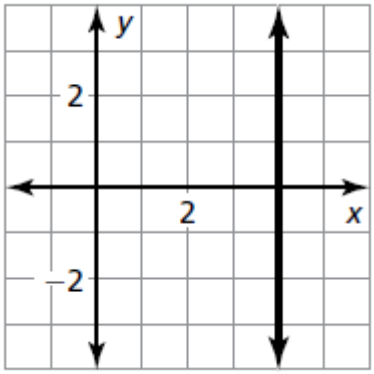
p. 145, #1-25 odd

1.



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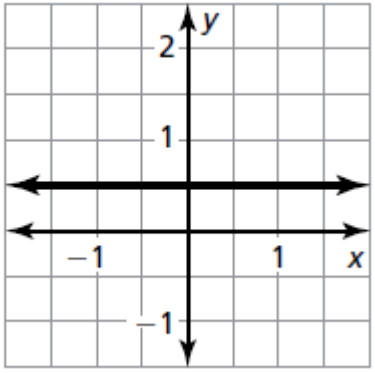


5.

$$2x + 3y = 12$$
$$2x + 3(0) = 12$$
$$2x = 12$$
$$\frac{2x}{2} = \frac{12}{2}$$
$$x = 6$$

The x-intercept is 6.

$$2x + 3y = 12$$
$$2(0) + 3y = 12$$
$$3y = 12$$
$$\frac{3y}{3} = \frac{12}{3}$$
$$y = 4$$

The y-intercept is 4.

7.

$3x - 6y = 2$

$3x - 6(0) = 2$

$3x = 2$

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

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

The x-intercept is $\frac{2}{3}$.

$3x - 6y = 2$

$3(0) - 6y = 2$

$-6y = 2$

$\frac{-6y}{-6} = \frac{2}{-6}$

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

The y-intercept is $-\frac{1}{3}$.

9.

$5x + 3y = 30$

$5x + 3(0) = 30$

$5x = 30$

$\frac{5x}{5} = \frac{30}{5}$

$x = 6$

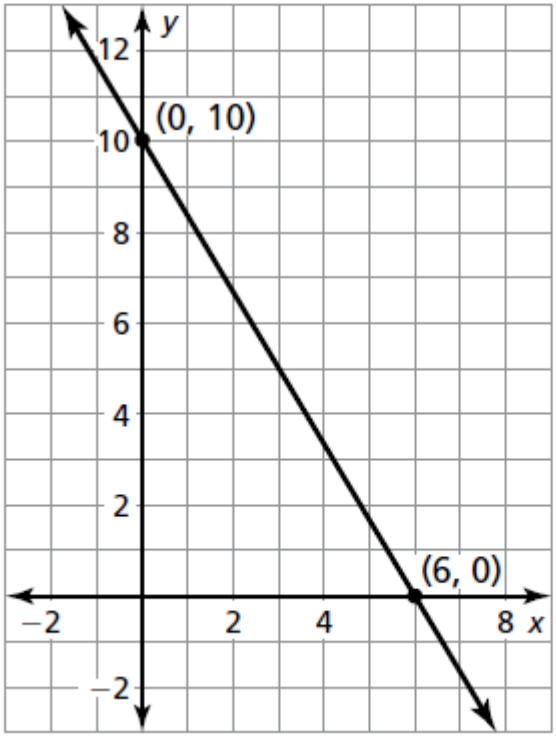
$5x + 3y = 30$

$5(0) + 3y = 30$

$3y = 30$

$\frac{3y}{3} = \frac{30}{3}$

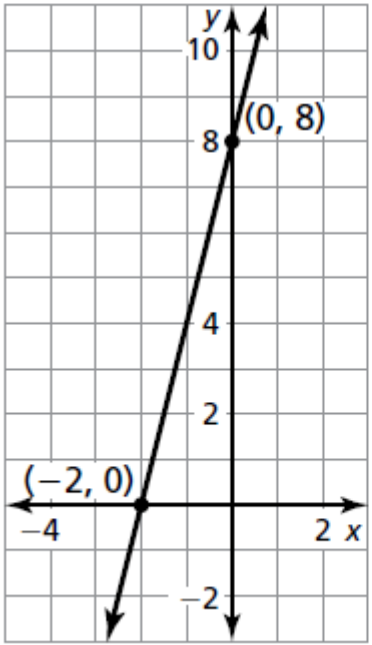
$y = 10$



11.

$$-12x + 3y = 24$$
$$-12x + 3(0) = 24$$
$$-12x = 24$$
$$\frac{-12x}{-12} = \frac{24}{-12}$$
$$x = -2$$

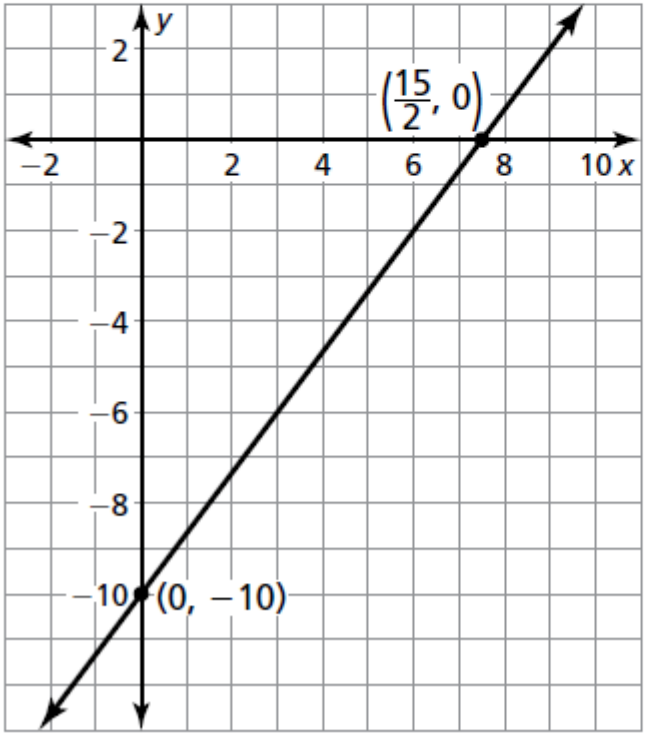
$$-12x + 3y = 24$$
$$-12(0) + 3y = 24$$
$$3y = 24$$
$$\frac{3y}{3} = \frac{24}{3}$$
$$y = 8$$



13.

$$-4x + 3y = -30$$
$$-4x + 3(0) = -30$$
$$-4x = -30$$
$$\frac{-4x}{-4} = \frac{-30}{-4}$$
$$x = \frac{15}{2}$$

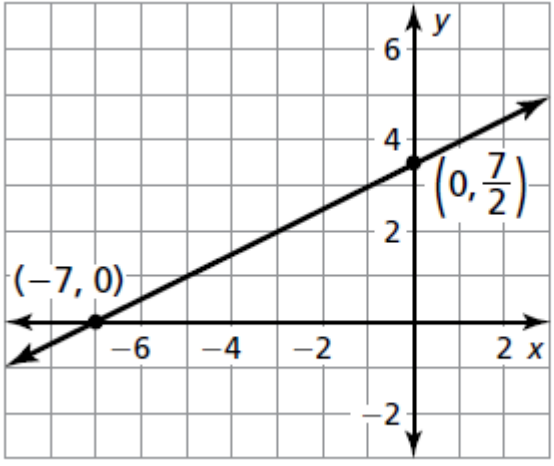
$$-4x + 3y = -30$$
$$-4(0) + 3y = -30$$
$$3y = -30$$
$$\frac{3y}{3} = \frac{-30}{3}$$
$$y = -10$$



15.

$$-x + 2y = 7$$
$$-x + 2(0) = 7$$
$$-x = 7$$
$$\frac{-x}{-1} = \frac{7}{-1}$$
$$x = -7$$

$$-x + 2y = 7$$
$$-(0) + 2y = 7$$
$$2y = 7$$
$$\frac{2y}{2} = \frac{7}{2}$$
$$y = \frac{7}{2}$$



17. $\frac{4}{3} + \frac{2}{3}x = \frac{1}{6}y$

$\frac{4}{3} + \frac{2}{3}x = \frac{1}{6}(0)$

$\frac{4}{3} + \frac{2}{3}x = 0$

$-\frac{4}{3} \qquad -\frac{4}{3}$

$\frac{2}{3}x = -\frac{4}{3}$

$\frac{3}{2}\left(\frac{2}{3}x\right) = \frac{3}{2}\left(-\frac{4}{3}\right)$

$x = -2$

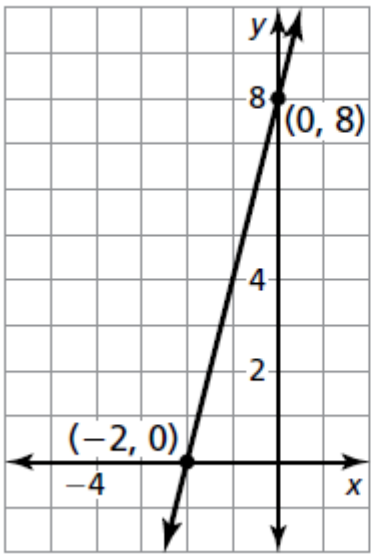
$\frac{4}{3} + \frac{2}{3}x = \frac{1}{6}y$

$\frac{4}{3} + \frac{2}{3}(0) = \frac{1}{6}y$

$\frac{4}{3} = \frac{1}{6}y$

$6\left(\frac{4}{3}\right) = 6\left(\frac{1}{6}y\right)$

$8 = y$



19. A; When $y = 0$, $x = 6$, and when $x = 0$, $y = 10$. So, the x-intercept is 6 and the y-intercept is 10.

$5x + 3y = 30$

$5x + 3(0) = 30$

$5x = 30$

$\frac{5x}{5} = \frac{30}{5}$

$x = 6$

$5x + 3y = 30$

$5(0) + 3y = 30$

$3y = 30$

$\frac{3y}{3} = \frac{30}{3}$

$y = 10$

21. D; When $y = 0$, $x = 6$, and when $x = 0$, $y = -10$. So, the x-intercept is 6 and the y-intercept is -10.

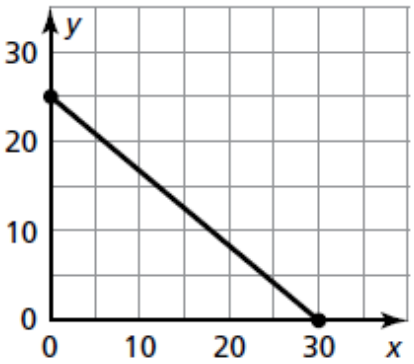
$$\begin{aligned} 5x - 3y &= 30 \\ 5x - 3(0) &= 30 \\ 5x &= 30 \\ \frac{5x}{5} &= \frac{30}{5} \\ x &= 6 \end{aligned} \qquad \begin{aligned} 5x - 3y &= 30 \\ 5(0) - 3y &= 30 \\ -3y &= 30 \\ \frac{-3y}{-3} &= \frac{30}{-3} \\ y &= -10 \end{aligned}$$

23. a. The term, $10x$, is the cost of the short-sleeved shirts, the term, $12y$, is cost of the long-sleeved shirts, and the constant term, 300, is the budgeted amount. The coefficient of 10 is the cost of one short-sleeved shirt and the coefficient 12 is the cost of one long-sleeved shirt.

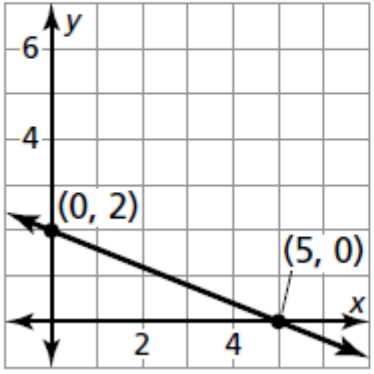
b.

$$10x + 12y = 300$$
$$10x + 12(0) = 300$$
$$10x = 300$$
$$\frac{10x}{10} = \frac{300}{10}$$
$$x = 30$$

$$10x + 12y = 300$$
$$10(0) + 12y = 300$$
$$12y = 300$$
$$\frac{12y}{12} = \frac{300}{12}$$
$$y = 25$$



The x-intercept shows that you can order 30 short-sleeve shirts if you do not order any long-sleeve shirts. The y-intercept shows that you can order 25 long-sleeve shirts if you do not order any short-sleeve shirts.

c. 12 short-sleeved shirts and 15 long-sleeved shirts;
24 short-sleeved shirts and 5 long-sleeved shirts;
18 short-sleeved shirts and 10 long-sleeved shirts

25. The x- and y-intercepts are switched. The x-intercept is $(5, 0)$ and the y-intercept is $(0, 2)$.