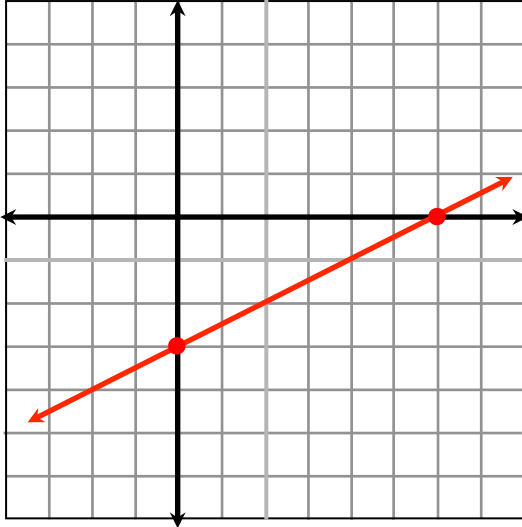


<p><b>1.</b> State the <math>x</math>-intercept and <math>y</math>-intercept of each</p> <p><b>(a)</b> <math>6x - 4y = 12</math></p> <p>(Use "cover and solve")  <math>x</math>-intercept: ( 2 , 0 )  <math>y</math>-intercept: ( 0 , -3 )</p> <p><b>(b)</b> <math>\frac{5}{3}x - 5y = \frac{5}{3}</math></p> $3\left(\frac{5}{3}x - 5y\right) = 3\left(\frac{5}{3}\right)$ $5x - 15y = 5$ <p><math>x</math>-intercept: ( 1 , 0 )  <math>y</math>-intercept: ( 0 , <math>-\frac{1}{3}</math> )</p>	<p><b>2.</b> Graph <math>x - 2y = 6</math></p> <p><math>x</math>-intercept: ( 6 , 0 )  <math>y</math>-intercept: ( 0 , -3 )</p> 
<p><b>3.</b> Find the slope and <math>y</math>-intercept of</p> <p><b>(a)</b> <math>y = 5x - 1</math></p> <p><math>m = 5</math> and <math>b = -1</math>  or slope = 5 and <math>y</math>-intercept = (0, -1)</p> <p><b>(b)</b> <math>y = 10</math></p> <p><math>m = 0</math> and <math>b = 10</math>  or slope = 0 and <math>y</math>-intercept = (0, 10)</p>	<p><b>4.</b> Find the slope and <math>y</math>-intercept of</p> <p><b>(a)</b> <math>y = -x</math></p> <p><math>m = -1</math> and <math>b = 0</math>  or slope = -1 and <math>y</math>-intercept = (0, 0)</p> <p><b>(b)</b> <math>-2x + 3y = 9</math></p> $\begin{array}{r} +2x \qquad +2x \\ 0 + 3y = 2x + 9 \\ \frac{3y}{3} = \frac{2x + 9}{3} \\ y = \frac{2}{3}x + 3 \end{array}$ <p><math>m = \frac{2}{3}</math> and <math>b = 3</math>  or slope = <math>\frac{2}{3}</math> and <math>y</math>-intercept = (0, 3)</p>

5. Write the equation in slope-intercept form ( $y = mx + b$ ) of a line that has slope 1 and passes through  $(-3, 4)$

$$\begin{aligned}y - y_1 &= m(x - x_1) \\y - 4 &= 1(x - (-3)) \\y - 4 &= 1(x + 3) \\y - 4 &= x + 3 \\+4 & \quad +4 \\y + 0 &= x + 7 \\y &= x + 7\end{aligned}$$

6. Determine the equation in slope-intercept form ( $y = mx + b$ ) of the line through

$(-3, -5)$  and  $(6, -2)$

$$\begin{aligned}m &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - (-5)}{6 - (-3)} = \frac{-2 + 5}{6 + 3} = \frac{3}{9} = \frac{1}{3} \\y - y_1 &= m(x - x_1) \\y - (-2) &= \frac{1}{3}(x - 6) \\y + 2 &= \frac{1}{3}(x - 6) \\y + 2 &= \frac{1}{3}x - 2 \\-2 & \quad -2 \\y + 0 &= \frac{1}{3}x - 4 \\y &= \frac{1}{3}x - 4\end{aligned}$$

7. Determine the equation in slope-intercept form ( $y = mx + b$ ) of the line through

$(3, -3)$  that is perpendicular to  $y = -3x + 3$

$$\begin{aligned}m &= -3, \text{ so then } m_{\perp} = \frac{1}{3} \\y - y_1 &= m(x - x_1) \\y - (-3) &= \frac{1}{3}(x - 3) \\y + 3 &= \frac{1}{3}(x - 3) \\y + 3 &= \frac{1}{3}x - 1 \\-3 & \quad -3 \\y + 0 &= \frac{1}{3}x - 4 \\y &= \frac{1}{3}x - 4\end{aligned}$$

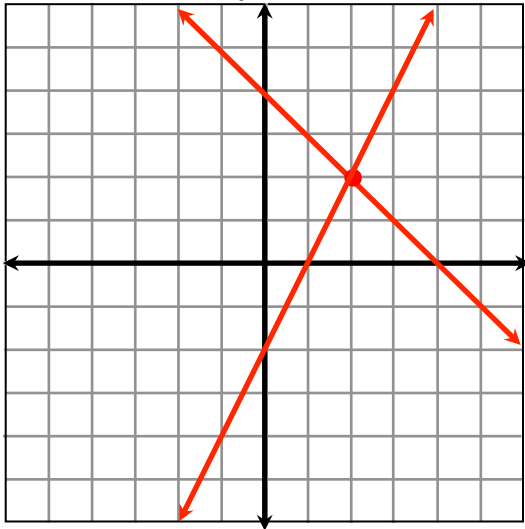
8. Determine the equation in slope-intercept form ( $y = mx + b$ ) of the line through

$(6, 5)$  that is parallel to  $2x - 3y = 6$

$$\begin{aligned}2x - 3y &= 6 \\-2x & \quad -2x \\0 - 3y &= -2x + 6 \\-3y &= -2x + 6 \\-3 & \quad -3 \\y &= \frac{2}{3}x + (-2) \\m &= \frac{2}{3} \\y - y_1 &= m(x - x_1) \\y - 5 &= \frac{2}{3}(x - 6) \\y - 5 &= \frac{2}{3}(x - 6) \\y - 5 &= \frac{2}{3}x - 4 \\+5 & \quad +5 \\y + 0 &= \frac{2}{3}x + 1 \\y &= \frac{2}{3}x + 1\end{aligned}$$

**9. Solve the system by graphing**  
and state the solution category.

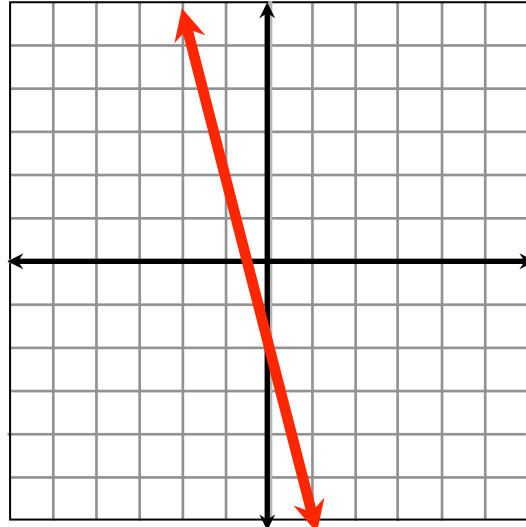
$$\begin{aligned} x + y &= 4 \\ 2x - y &= 2 \end{aligned}$$



System solution:  $\{(2, 2)\}$   
Consistent and independent

**10. Solve the system by graphing**  
and state the solution category.

$$\begin{aligned} 4x + y &= -2 \\ \frac{1}{4}y &= -x - \frac{1}{2} \end{aligned} \quad \begin{aligned} 4\left(\frac{1}{4}y\right) &= 4\left(-x - \frac{1}{2}\right) \\ y &= -4x - 2 \end{aligned}$$



System solution:  $\{(x, y) \mid 4x + y = -2\}$   
Consistent and dependent

**11. Solve the system by substitution**  
and state the solution category.

$$\begin{aligned} x &= 2y - 3 \\ 5x - 4y &= 9 \end{aligned}$$

$$\begin{aligned} 5x - 4y &= 9 \\ 5(2y - 3) - 4y &= 9 \\ 10y - 15 - 4y &= 9 \\ 6y - 15 &= 9 \\ \quad +15 \quad +15 & \\ 6y + 0 &= 24 \\ \frac{6y}{6} &= \frac{24}{6} \\ y &= 4 \end{aligned}$$

$$\begin{aligned} x &= 2y - 3 \\ x &= 2 \cdot 4 - 3 \\ x &= 8 - 3 \\ x &= 5 \end{aligned}$$

System solution:  $\{(5, 4)\}$   
Consistent and independent

**12. Solve the system by substitution**  
and state the solution category.

$$\begin{aligned} 4x &= y + 3 \\ 3x - 2y &= 1 \end{aligned} \quad \begin{aligned} 4x &= y + 3 \\ \quad -3 \quad -3 & \\ 4x - 3 &= y + 0 \\ 4x - 3 &= y \end{aligned}$$

$$\begin{aligned} 3x - 2y &= 1 \\ 3x - 2(4x - 3) &= 1 \\ 3x - 8x + 6 &= 1 \\ -5x + 6 &= 1 \\ \quad -6 \quad -6 & \\ -5x + 0 &= -5 \\ \frac{-5x}{-5} &= \frac{-5}{-5} \\ x &= 1 \end{aligned}$$

$$\begin{aligned} 4x &= y + 3 \\ 4 \cdot 1 &= y + 3 \\ 4 &= y + 3 \\ -3 \quad -3 & \\ 1 &= y + 0 \\ 1 &= y \end{aligned}$$

System solution:  $\{(1, 1)\}$   
Consistent and independent

**13.** Solve the system by elimination and state the solution category.

$$\begin{aligned}x + y &= -4 \\x - y &= 8\end{aligned}$$

$$\begin{aligned}x + y &= -4 \\ \underline{x - y} &= \underline{8} \\ 2x + 0 &= 4 \\ \frac{2x}{2} &= \frac{4}{2} \\ x &= 2\end{aligned}$$

$$\begin{aligned}x + y &= -4 \\ 2 + y &= -4 \\ \underline{-2} \quad \underline{-2} & \\ 0 + y &= -6 \\ y &= -6\end{aligned}$$

System solution:  $\{(2, -6)\}$   
Consistent and independent

**14.** Solve the system by elimination and state the solution category.

$$\begin{aligned}2x - 3y &= 16 \\ 2x - 5y &= 24 \quad -1(2x - 5y) = -1(24) \\ & \quad \quad \quad -2x + 5y = -24\end{aligned}$$

$$\begin{aligned}2x - 3y &= 16 \\ \underline{-2x + 5y} &= \underline{-24} \\ 0 + 2y &= -8 \\ \frac{2y}{2} &= \frac{-8}{2} \\ y &= -4\end{aligned}$$

$$\begin{aligned}2x - 3y &= 16 \\ 2x - 3(-4) &= 16 \\ 2x + 12 &= 16 \\ \underline{-12} \quad \underline{-12} & \\ 2x + 0 &= 4 \\ \frac{2x}{2} &= \frac{4}{2} \\ x &= 2\end{aligned}$$

System solution:  $\{(2, -4)\}$   
Consistent and independent

**15.** Solve the system by elimination and state the solution category.

$$\begin{aligned}5x + y &= 12 \\ 2x - 2y &= 0 \quad 2(5x + y) = 2 \cdot 12 \\ & \quad \quad \quad 10x + 2y = 24\end{aligned}$$

$$\begin{aligned}10x + 2y &= 24 \\ \underline{2x - 2y} &= \underline{0} \\ 12x + 0 &= 24 \\ \frac{12x}{12} &= \frac{24}{12} \\ x &= 2\end{aligned}$$

$$\begin{aligned}5x + y &= 12 \\ 5 \cdot 2 + y &= 12 \\ 10 + y &= 12 \\ \underline{-10} \quad \underline{-10} & \\ 0 + y &= 2 \\ y &= 2\end{aligned}$$

System solution:  $\{(2, 2)\}$   
Consistent and independent

**16.** Solve the system by elimination and state the solution category.

$$\begin{aligned}6x + 5y &= 4 \\ -4x + 2y &= 8 \quad 2(6x + 5y) = 2 \cdot 4 \\ & \quad \quad \quad 12x + 10y = 8 \\ & \quad \quad \quad -5(-4x + 2y) = -5 \cdot 8 \\ & \quad \quad \quad 20x - 10y = -40\end{aligned}$$

$$\begin{aligned}12x + 10y &= 8 \\ \underline{20x - 10y} &= \underline{-40} \\ 32x + 0 &= -32 \\ \frac{32x}{32} &= \frac{-32}{32} \\ x &= -1\end{aligned}$$

$$\begin{aligned}6x + 5y &= 4 \\ 6(-1) + 5y &= 4 \\ -6 + 5y &= 4 \\ +6 \quad +6 & \\ 0 + 5y &= 10 \\ \frac{5y}{5} &= \frac{10}{5} \\ y &= 2\end{aligned}$$

System solution:  $\{(-1, 2)\}$   
Consistent and independent

**17.** A landscape designer invested a total of \$6000, some at 4% and the rest at 2%. He earned \$162 in interest after one year. How much did he invest at each rate?

	4%	2%	Total
Amount invested	$x$	$y$	\$6000
Interest earned	$.04x$	$.02y$	\$162

Equations:  $x + y = 6,000$   
 $.04x + .02y = 162$   
 $100(.04x + .02y) = 100(162)$   
 $4x + 2y = 16,200$   
 $-2(x + y) = -2(6,000)$   
 $-2x + -2y = -12,000$   
 $4x + 2y = 16,200$   
 $-2x + -2y = -12,000$   
 $2x + 0 = 4,200$   
 $\frac{2x}{2} = \frac{4200}{2}$   
 $x = 2,100$

$x = 2100$   
 $x + y = 6,000$   
 $2,100 + y = 6,000$   
 $-2,100 \quad -2,100$   
 $0 + y = 3,900$   
 $y = 3,900$

\$2,100 was invested at 4%  
 \$3,900 was invested at 2%

**18.** How many pounds each of cookie dough containing 15% chocolate chips and dough containing 30% chocolate chips must be mixed to obtain 100 pounds of cookie dough containing 18% chocolate chips?

	15%	30%	18%
Pounds of dough	$x$	$y$	100
Pounds of chocolate chips	$.15x$	$.30y$	$.18(100)$

Equations:  $x + y = 100$   
 $.15x + .30y = 18$   
 $100(.15x + .30y) = 100(18)$   
 $15x + 30y = 1,800$   
 $-30(x + y) = -30(100)$   
 $-30x + -30y = -3,000$   
 $15x + 30y = 1,800$   
 $-30x + -30y = -3,000$   
 $-15x + 0 = -1,200$   
 $\frac{-15x}{-15} = \frac{-1200}{-15}$   
 $x = 80$

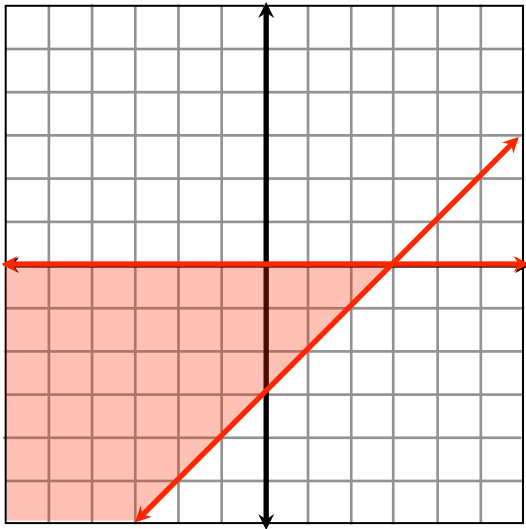
$x = 80$   
 $x + y = 100$   
 $80 + y = 100$   
 $-80 \quad -80$   
 $0 + y = 20$   
 $y = 20$

80 pounds of 15%  
 20 pounds of 30%

**19.** Solve the system by graphing.

$$y \leq 0$$

$$y \geq x - 3$$



**20.** Solve the system by graphing.

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

$$x - y < 1$$

