1. State the x-intercept and y-intercept of each

(a) $6x - 4y = 12$

(Use "cover and solve")
x-intercept: (2 , 0)

y-intercept: (0 , –3)

(b) $\frac{5}{3}x - 5y = \frac{5}{3}$

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

$5x - 15y = 5$

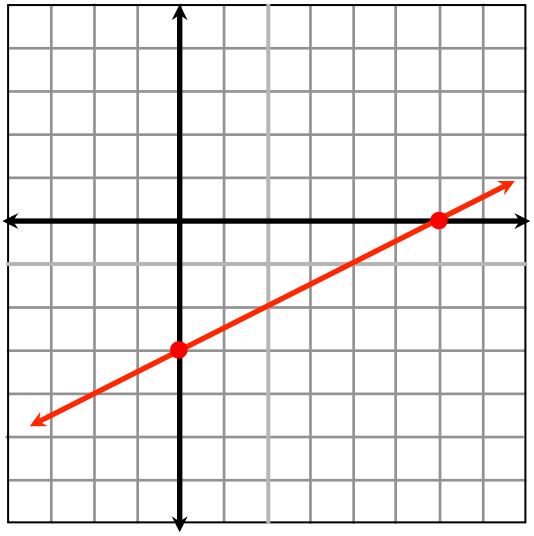
x-intercept: (1 , 0)

y-intercept: (0 , $-\frac{1}{3}$)

2. Graph $x - 2y = 6$

x-intercept: (6 , 0)

y-intercept: (0 , –3)



3. Find the slope and y-intercept of

(a) $y = 5x - 1$

$m = 5$ and $b = -1$
or slope = 5 and y-intercept = (0, –1)

(b) $y = 10$

$m = 0$ and $b = 10$
or slope = 0 and y-intercept = (0, 10)

4. Find the slope and y-intercept of

(a) $y = -x$

$m = -1$ and $b = 0$
or slope = –1 and y-intercept = (0, 0)

(b) $-2x + 3y = 9$

$+2x \qquad +2x$

$0 + 3y = 2x + 9$

$\frac{3y}{3} = \frac{2x+9}{3}$

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

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

or slope = $\frac{2}{3}$ and y-intercept = (0, 3)

5. Write the equation in slope-intercept form ($y = mx + b$) of a line that has

slope 1 and passes through (–3, 4)

$y - y_1 = m(x - x_1)$
$y - 4 = 1(x - (-3))$
$y - 4 = 1(x + 3)$
$y - 4 = x + 3$
$+4 \quad +4$
$y + 0 = x + 7$
$y = x + 7$

= m(x – x1)6. Determine the equation in slope-intercept form ($y = mx + b$) of the line through

(–3, –5) and (6, –2)

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2-(-5)}{6-(-3)} = \frac{-2+5}{6+3} = \frac{3}{9} = \frac{1}{3}$

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

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

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

$m = -3$, so then $m_\perp = \frac{1}{3}$

$y - y_1 = m(x - x_1)$
$y - (-3) = \frac{1}{3}(x - 3)$
$y + 3 = \frac{1}{3}(x - 3)$
$y + 3 = \frac{1}{3}x - 1$
$-3 \quad -3$
$y + 0 = \frac{1}{3}x - 4$
$y = \frac{1}{3}x - 4$

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

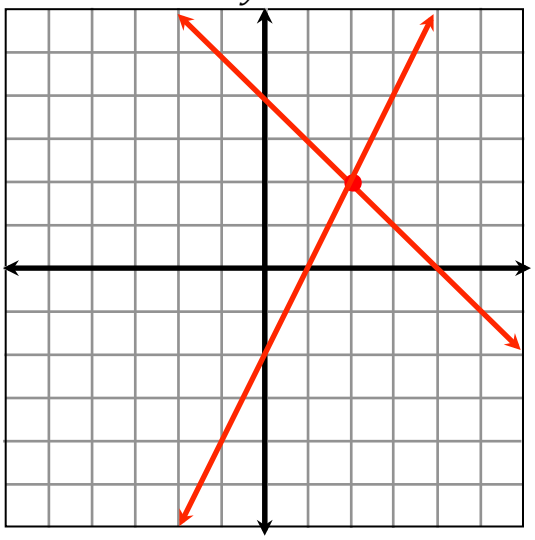
(6, 5) that is parallel to $2x - 3y = 6$

$2x - 3y = 6$
$-2x \quad -2x$
$0 - 3y = -2x + 6$
$\frac{-3y}{-3} = \frac{-2x+6}{-3}$
$y = \frac{2}{3}x + (-2)$
$m = \frac{2}{3}$

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

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

$x + y = 4$
$2x - y = 2$

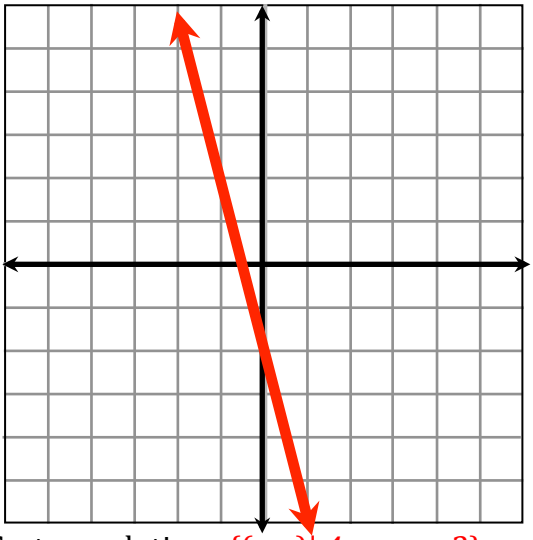


System solution: {(2, 2)}
Consistent and independent

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

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

$4\left(\frac{1}{4}y\right) = 4\left(-x - \frac{1}{2}\right)$
$y = -4x - 2$



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

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

$x = 2y - 3$
$5x - 4y = 9$

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

$x = 2y - 3$
$x = 2 \cdot 4 - 3$
$x = 8 - 3$
$x = 5$

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

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

$4x = y + 3$
$3x - 2y = 1$

$4x = y + 3$
$-3 \quad -3$
$4x - 3 = y + 0$
$4x - 3 = y$

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

$4x = y + 3$
$4 \cdot 1 = y + 3$
$4 = y + 3$
$-3 \quad -3$
$1 = y + 0$
$1 = y$

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

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

$x + y = -4$
$x - y = 8$

$x + y = -4$
$\underline{x - y = \ 8}$
$2x + 0 = \ 4$
$\frac{2x}{2} = \frac{4}{2}$
$x = 2$

$x + y = -4$
$2 + y = -4$
$\underline{-2 \qquad -2}$
$0 + y = -6$
$y = -6$

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

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

$2x - 3y = 16$
$2x - 5y = 24$

$-1(2x - 5y) = -1(24)$
$-2x + 5y = -24$

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

$2x - 3y = 16$
$2x - 3(-4) = 16$
$2x \ + 12 = 16$
$\underline{-12 \ \ -12}$
$2x \ + 0 = 4$
$\frac{2x}{2} = \frac{4}{2}$
$x = 2$

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

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

$5x + y = 12$
$2x - 2y = 0$

$2(5x + y) = 2 \bullet 12$
$10x + 2y = 24$

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

$5x + y = 12$
$5 \bullet 2 + y = 12$
$10 + y = 12$
$\underline{-10 \qquad -10}$
$0 + y = \ 2$
$y = 2$

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

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

$6x + 5y = 4$
$-4x + 2y = 8$

$2(6x + 5y) = 2 \bullet 4$
$12x + 10y = 8$

$-5(-4x + 2y) = -5 \bullet 8$
$20x + -10y = -40$

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

$6x + 5y = 4$
$6(-1) + 5y = 4$
$-6 + 5y = 4$
$\underline{+6 \qquad +6}$
$0 + 5y = 10$
$\frac{5y}{5} = \frac{10}{5}$
$y = 2$

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: $x + y = 6{,}000$

$.04x + .02y = 162$

$100(.04x + .02y) = 100(162)$

$4x + 2y = 16{,}200$

$-2(x + y) = -2(6{,}000)$

$-2x + -2y = -12{,}000$

$4x + 2y = 16{,}200$

$\underline{-2x + -2y = -12{,}000}$

$2x + 0 = 4{,}200$

$\frac{2x}{2} = \frac{4200}{2}$

$x = 2{,}100$

$x = 2100$

$x + y = 6{,}000$

$2{,}100 + y = 6{,}000$

$\underline{-2{,}100 \quad -2{,}100}$

$0 + y = 3{,}900$

$y = 3{,}900$

$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: $x + y = 100$

$.15x + .30y = 18$

$100(.15x + .30y) = 100(18)$

$15x + 30y = 1{,}800$

$-30(x + y) = -30(100)$

$-30x + -30y = -3{,}000$

$15x + 30y = 1{,}800$

$\underline{-30x + -30y = -3{,}000}$

$-15x + 0 = -1{,}200$

$\frac{-15x}{-15} = \frac{-1200}{-15}$

$x = 80$

$x = 80$

$x + y = 100$

$80 + y = 100$

$\underline{-80 \quad -80}$

$0 + y = 20$

$y = 20$

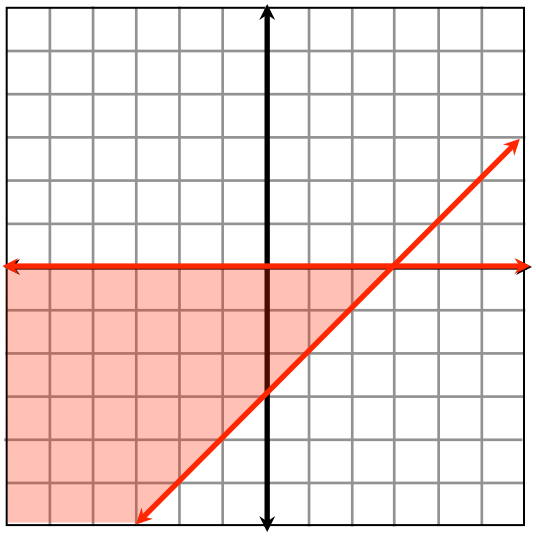
80 pounds of 15%

20 pounds of 30%

19. Solve the system by graphing.

$y \le 0$

$y \ge x - 3$



20. Solve the system by graphing.

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

$x - y < 1$