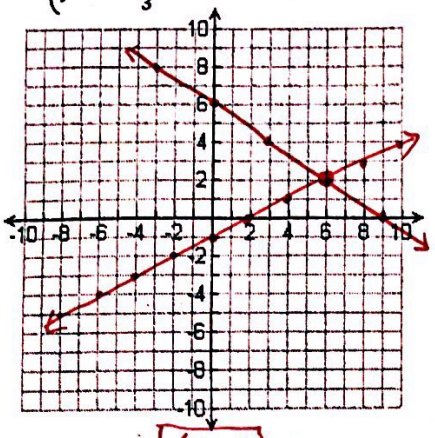
Solving Systems by Graphing: Review rise/run; pos up/right; neg down/right

If you need help with these: Go to **lischwe.weebly.com** and look at the lesson on December 5. Look at December 6 for help with getting y by itself.

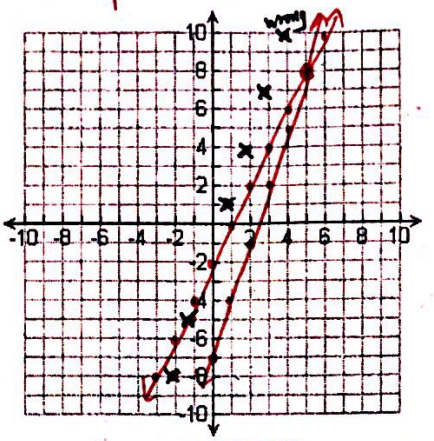
Solve the system by graphing.

1) $\begin{cases} y = \frac{1}{2}x - 1 \\ y = -\frac{2}{3}x + 6 \end{cases}$ (0,-1), up 1 right 2; (0,6), down 2 right 3



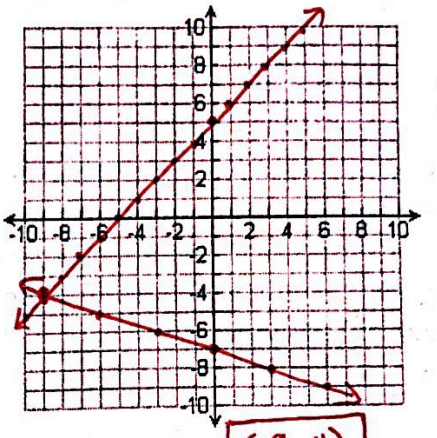
(6,2)

2) $\begin{cases} y = 2x - 2 \\ y = \frac{3}{1}x - 7 \end{cases}$ (0,-2) up 2 right 1; (0,-7) up 3 right 1



(5,8)

3) $\begin{cases} y = \frac{1}{1}x + 5 \\ y = -\frac{1}{3}x - 7 \end{cases}$ (0,5) up 1 right 1; (0,-7) down 1 right 3

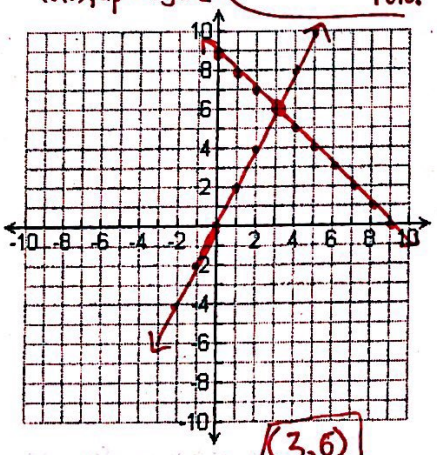


(-9,-4)

4) $\begin{cases} x + y = 9 \\ y = 2x + 0 \end{cases}$ Solve for y → $y = 9 - x$ or Table

x	y
0	9
1	8
2	7
etc.	

(0,0), up 2 right 1



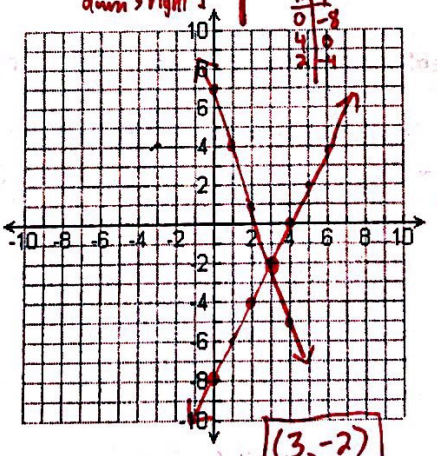
(3,6)

5) $\begin{cases} -4x + 2y = -16 \\ y = -\frac{3}{1}x + 7 \end{cases}$ Solve for y → $\frac{2y}{2} = \frac{-16}{2} + \frac{4x}{2}$, $y = -8 + 2x$

(0,7) down 3 right 1

Table

x	y
0	-8
4	0
2	-4



(3,-2)

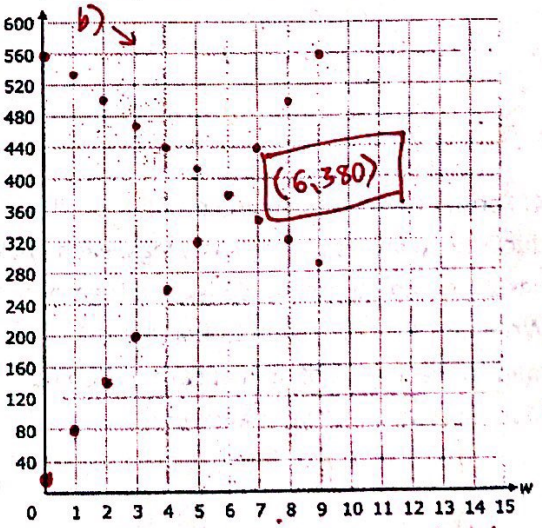
6) Reynold has $20 in his bank account and deposits $60 per month. Keith has $560 in his bank account but withdraws $30 per month.

a) Write a system of equations. a) $\begin{cases} y = 20 + 60x \\ y = 560 - 30x \end{cases}$

b) Graph them and find the intersection.

c) Explain what the numbers in your solution represent.

d) Check your answer.



c) After 6 weeks, both Reynold and Keith have $380 in their accounts.

d)

7) Choose two problems from #1 – 6, then check your solution by substituting the numbers back into both original equations.

① $2 = \frac{1}{2}(6) - 1$; $2 = 3 - 1$; $2 = 2$ ✓

$2 = -\frac{2}{3}(6) + 6$; $2 = -\frac{12}{3} + 6$; $2 = -4 + 6$; $2 = 2$ ✓

② $8 = 2(5) - 2$; $8 = 10 - 2$; $8 = 8$ ✓

$8 = 3(5) - 7$; $8 = 15 - 7$; $8 = 8$ ✓

③ $-4 = -9 + 5$; $-4 = -4$ ✓

$-4 = -\frac{1}{3}(-9) - 7$; $-4 = 3 - 7$; $-4 = -4$ ✓

④ $3 + 6 = 9$; $9 = 9$ ✓

$6 = 2(3)$; $6 = 6$ ✓

⑤ $-4(3) + 2(-2) = -16$; $-12 + -4 = -16$; $-16 = -16$ ✓

$-2 = -3(3) + 7$; $-2 = -9 + 7$; $-2 = -2$ ✓

⑥ $380 = 20 + 60(6)$; $380 = 20 + 360$; $380 = 380$ ✓

$380 = 560 - 30(6)$; $380 = 560 - 180$; $380 = 380$ ✓

Solving Systems by Substitution: Review

If you need help with these: Go to **lischwe.weebly.com** and look at the lessons on December 6 and 7. Look at the lesson on December 10 for help on the story problems.

Solve by substitution. Use the back if necessary. Don't forget to find both x and y!!!

1) $\begin{cases} y = -x + 10 \\ y = 6x + 59 \end{cases}$

$-x+10 = 6x+59$
$+x \quad +x$
$10 = 7x + 59$
$-59 \quad -59$
$\frac{-49}{7} = \frac{7x}{7}$
$-7 = x$

Find y: $y = -(-7)+10$, $y = 7+10$, $y = 17$

$(-7, 17)$

2) $\begin{cases} y = 3x \\ x - 2y = 15 \end{cases}$

$x - 2(3x) = 15$
$x - 6x = 15$
$\frac{-5x}{-5} = \frac{15}{-5}$
$x = -3$

Find y: $y = 3(-3)$, $y = -9$

$(-3, -9)$

3) $\begin{cases} x = 5y - 12 \\ x + 3y = 12 \end{cases}$

$5y - 12 + 3y = 12$
$8y - 12 = 12$
$+12 \quad +12$
$\frac{8y}{8} = \frac{24}{8}$
$y = 3$

Find x: $x = 5(3) - 12$, $x = 15 - 12$, $x = 3$

$(3, 3)$

4) $\begin{cases} -3x + 5y = 0 \\ y = x - 6 \end{cases}$

$-3x + 5(x-6) = 0$
$-3x + 5x - 30 = 0$
$2x - 30 = 0$
$+30 \quad +30$
$\frac{2x}{2} = \frac{30}{2}$
$x = 15$

Find y: $y = 15 - 6$, $y = 9$

$(15, 9)$

5) There are 100 members in the US Senate. Currently, there are four times as many men as women. Write a system of equations, solve it, and describe what the numbers in your solution represent. Make sure to check your answer.

M = # of men
W = # of women

$\begin{cases} M + W = 100 \\ M = 4W \end{cases}$

Diagram Method

Men: W W W W
Women: W
100

$4W + W = 100$
etc.

$4W + W = 100$
$\frac{5W}{5} = \frac{100}{5}$
$W = 20$

$M = 4(20)$
$M = 80$

80 men, 20 women

check: $80 + 20 = 100$ ✓

6) $\begin{cases} y = \frac{3}{2}x \\ y = -1x + 10 \end{cases}$ common denominators

$\frac{3}{2}x = -1x + 10$
$\frac{3}{2}x = -\frac{2}{2}x + 10$
$+\frac{2}{2}x \quad +\frac{2}{2}x$
$\frac{2}{5} \cdot \frac{5}{2}x = 10 \cdot \frac{2}{5}$
$x = 4$

Find y: $y = -1(4) + 10$, $y = -4 + 10$, $y = 6$

$(4, 6)$

7) $\begin{cases} 4x - 2y = -14 \\ y = -3x + 2 \end{cases}$

$4x - 2(-3x+2) = -14$
$4x + 6x - 4 = -14$
$10x - 4 = -14$
$+4 \quad +4$
$\frac{10x}{10} = \frac{-10}{10}$
$x = -1$

Find y: $y = -3(-1) + 2$, $y = 3 + 2$, $y = 5$

$(-1, 5)$

Solving Systems by Elimination: Review

If you need help with these: Go to **lischwe.weebly.com** and look at the lessons on December 10 and 11.

Solve by elimination. Use the back if necessary. Don't forget to find both x and y!!!

1) $\begin{cases} x + 4y = 9 \\ 3x - 4y = 19 \end{cases}$ don't need to multiply

$\frac{4x}{4} = \frac{28}{4}$
$x = 7$

Find y: $7 + 4y = 9$, $-7 \quad -7$, $\frac{4y}{4} = \frac{2}{4}$, $y = \frac{1}{2}$ or 0.5

$(7, \frac{1}{2})$

2) $\begin{cases} -x + 2y = -7 \\ 2x - 3y = 8 \end{cases}$ $\times -2 \rightarrow 2x - 4y = 14$

$2x - 3y = 8$
$y = -6$

Find x: $2x - 3(-6) = 8$, $2x + 18 = 8$, $-18 \quad -18$, $\frac{2x}{2} = \frac{-10}{2}$, $x = -5$

$(-5, -6)$

3) $\begin{cases} 5x + 3y = -14 \\ 5x - 4y = 42 \end{cases} \rightarrow 5x + 3y = -14$

$-5x + 4y = -42$
$7y = -56$
$y = -8$

Find x: $5x + 3(-8) = -14$, $5x - 24 = -14$, $+24 \quad +24$, $\frac{5x}{5} = \frac{10}{5}$, $x = 2$

$(2, -8)$

4) Farmer Ben has 22 animals – all are either ducks or cows. Each cow has 4 legs, each duck has 2 legs, and there are 56 legs all together. Write and solve a system to find out how many of each type of animal Farmer Ben has. Make sure to check your answer.

$-2(D + C = 22) \rightarrow -2D - 2C = -44$
$2D + 4C = 56 \rightarrow 2D + 4C = 56$
$2C = 12$
$\frac{2C}{2} = \frac{12}{2}$
$C = 6$

$22 - 6 = 16$

16 ducks, 6 cows

check: $16 \cdot 2 + 6 \cdot 4 = 56$
$32 + 24 = 56$
$56 = 56$ ✓

5) $\begin{cases} 2x + 6y = 22 \\ 3x - 4y = 7 \end{cases} \rightarrow 6x + 18y = 66$

$-6x + 8y = 14$
$\frac{26y}{26} = \frac{52}{26}$
$y = 2$

Find x: $2x + 6(2) = 22$, $2x + 12 = 22$, $-12 \quad -12$, $\frac{2x}{2} = \frac{10}{2}$, $x = 5$

$(5, 2)$

6) Check your answer for one of the problems from #1-3 or 5 by plugging the numbers into **both** original equations.

① $7 + 4(\frac{1}{2}) = 9$
$7 + 2 = 9$
$9 = 9$ ✓

$3(7) - 4(\frac{1}{2}) = 19$
$21 - 2 = 19$
$19 = 19$ ✓

② $-(-5) + 2(6) = -7$
$5 + -12 = -7$
$-7 = -7$ ✓

$2(-5) - 3(-6) = 8$
$-10 + 18 = 8$
$8 = 8$ ✓

③ $5(2) + 3(-8) = -14$
$10 + -24 = -14$
$-14 = -14$ ✓

$5(2) - 4(-8) = 42$
$10 + 32 = 42$
$42 = 42$ ✓

⑤ $2(6) + 6(2) = 24$
$10 + 12 = 22$
$22 = 22$ ✓

$3(5) - 4(2) = 7$
$15 - 8 = 7$
$7 = 7$ ✓