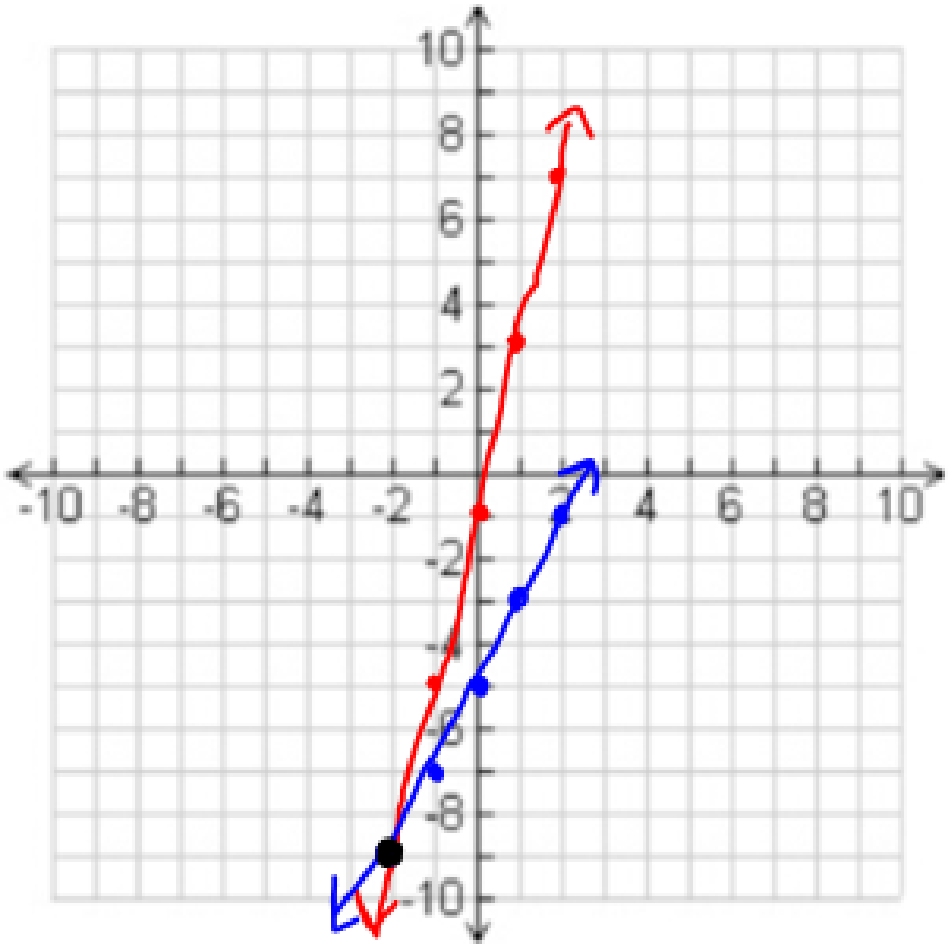
Review 5.1-5.2

Ex1) Solve the system by graphing.

$$\begin{cases} y = 4x - 1 \\ y = 2x - 5 \end{cases}$$

$(x, y) = (-2, -9)$



Ex2) Solve the system by substitution.

$$\begin{cases} 2x + y = -2 \\ 5x + 3y = -8 \end{cases} \rightarrow y = -2x - 2$$

$5x + 3(-2x - 2) = -8$

$5x - 6x - 6 = -8$

$-x - 6 = -8$

$-x = -2$

$x = 2$

$y = -2(2) - 2 = -4 - 2 = -6$

$(x, y) = (2, -6)$

5.3 Solving the System by Elimination

Elimination: to **cancel** out either the **x** or **y** by **adding** two equations.

Ex3) $\begin{cases} x+3y=24 \\ -x+2y=1 \end{cases}$ ⊕

Since the x has one positive and one negative, the x's cancel out by adding both equations.

$5y=25$

$y=5$

Plug $y=5$ into one of the equation to solve for x.

$x+3(5)=24$

$x+15=24$

$-15 \quad -15$

$x=9$

Solution:

$(x,y)=(9,5)$

add

Ex4) $\begin{cases} 3x - 4y = 9 \\ 5x + 4y = -17 \end{cases}$

Always starting to eliminate the variable that has the same number in the front with one positive and one negative.

$8x = -8$

$x = -1$

$5(-1) + 4y = -17$

$-5 + 4y = -17$

$+5 \qquad +5$

$4y = -12$

$y = -3$

Solution: $(x, y) = (-1, -3)$

Ex5) $\begin{cases} x+2y=15 \\ 5x=2y+3 \end{cases}$ copy

Rearrange the equation to the right setting before solving: both x and y are on the same side and the number is on the other side. Standard Form : $Ax+By=C$

$\begin{cases} x+2y=15 \\ 5x-2y=3 \end{cases}$ rearrange

Add the Two Equations !!

$6x=18$

$x=3$

$3+2y=15$

$2y=12$

$y=6$

Solution : $(x,y)=(3,6)$

Try this) $\begin{cases} x+y=1 \\ 2x-y=2 \end{cases}$ Add

$3x = 3$

$x = 1$

$1+y=1$

$y=0$

Solution : $(x, y) = (1, 0)$

If Nothing Cancels Out: you need to **multiple** one or both equations by a # to get either the x or y to cancel out.

Ex6) $\begin{cases} 3x+y=9 \\ 2x+y=1 \end{cases}$

$-\left(2x+y=1\right)$ (copy)

Since y has the same number in front but both positive, we just multiple one equation by a "–".

$\begin{cases} 3x+y=9 \\ -2x-y=-1 \end{cases}$ multiply by "-1"

Add the Equations

$x=8$

$2(8)+y=1$

$16+y=1$

$-16 \quad -16$

$y=-15$

Solution:

$(x,y)=(8,-15)$

Ex7) $\begin{cases} x = 5 - 9y \\ 4x + 9y = -7 \end{cases}$

Need to rearrange the equation!!

$\begin{cases} x + 9y = 5 \\ 4x + 9y = -7 \end{cases}$

$\begin{cases} -x - 9y = -5 \\ 4x + 9y = -7 \end{cases}$ Add

$3x = -12$

$x = -4$

$-4 + 9y = 5$

$+4 \qquad +4$

$9y = 9$

$y = 1$

Solution: $(x, y) = (-4, -1)$

Try this) $\begin{cases} x+2y=-2 \\ 4x+2y=-17 \end{cases}$

$-x-2y=2$

$4x+2y=-17$

$3x=-15$

$x=-5$

$-5+2y=-2$

$+5 \qquad +5$

$2y=3$

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

Solution: $(x, y)=(-5, \frac{3}{2})$

Ex 8) $\begin{cases} x+y=9 \\ 3x+8y=-3 \end{cases}$

$-3(x+y=9)$

$-3x-3y=-27$

$3x+8y=-3$

Add

$5y=-30$

$y=-6$

Need to have the same positive and negative number in front of x or y.
So, you may either multiply "–3" to the first equation to eliminate the x's or multiply "–8" to the first equation to eliminate the y's.

$x+(-6)=9$

$+6 \quad +6$

$x=15$

Solution : $(x,y)=(15,-6)$

Try this) $\begin{cases} 2x-3y=-11 \\ -(2x+y=9) \end{cases}$

$2x-3y=-11$

$-2x-y=-9$ add

$-4y=-20$

$y=5$

$2x+5=9$

$2x=4$

$x=2$

Solution : $(x, y)=(2, 5)$

Ex 9) $\begin{cases} 2x-3y=1 \\ 5x+4y=14 \end{cases}$

You need to try to get the x or y to cancel out, so you need to multiply one or both equation by a #. (look for a positive & a negative to cancel)

$4(2x-3y=1)$

$3(5x+4y=14)$

$8x-12y=4$

$15x+12y=42$ Add

$23x=46$

$x=2$

$5(2)+4y=14$

$10+4y=14$

$-10 \quad -10$

$4y=4$

$y=1$

Solution: $(x,y)=(2,1)$

Try this)

$$\begin{cases} 7x-3y=-5 \\ 3x+2y=11 \end{cases}$$

$2(7x-3y=-5) \rightarrow 14x-6y=-10$

$3(3x+2y=11) \rightarrow 9x+6y=33$ add

$23x=23$

$x=1$

$3(1)+2y=11$

$2y=8$

$y=4$

Solution : $(x,y)=(1,4)$