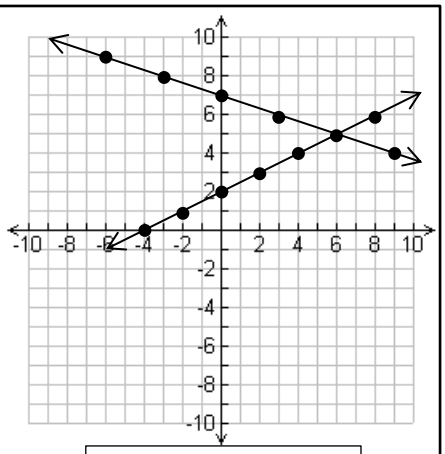
Name: _____

Solving Systems of Equations by Graphing

EXAMPLE

Solve the system by graphing: $\begin{cases} y = -\frac{1}{3}x + 7 \\ -2x + 4y = 8 \end{cases}$



Solution: (6, 5)

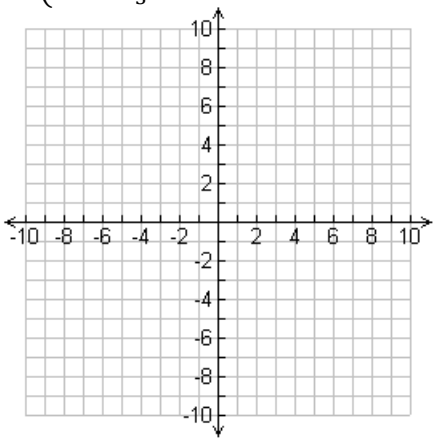
Step 1: Graph the first equation. Start at (0, 7), then go down 1 and right 3. Continue the pattern.

Step 2: Graph the second equation. One strategy is to get y by itself and use slope-intercept rules. If you add 2x to both sides, you get $4y = 8 + 2x$. Then if you divide everything by 4, you get $y = 2 + \frac{1}{2}x$. Another strategy is to make a table and find some (x, y) pairs that make the equation true. Three easy points that would make $-2x + 4y = 8$ true are (0, 2), (-4, 0), and (-2, 1).

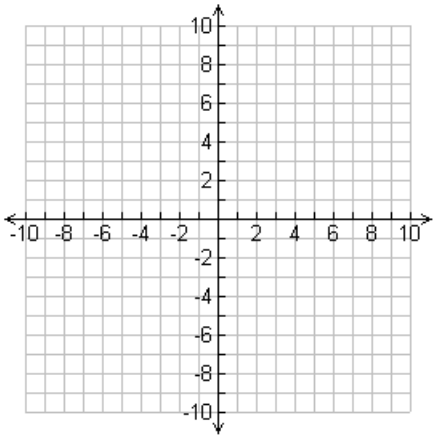
Step 3: Connect the points. You will see that the slope of the second line is ½. Continue this pattern until both lines intersect. The intersection point is (6, 5).

Solve each system by graphing both equations and finding the point of intersection.

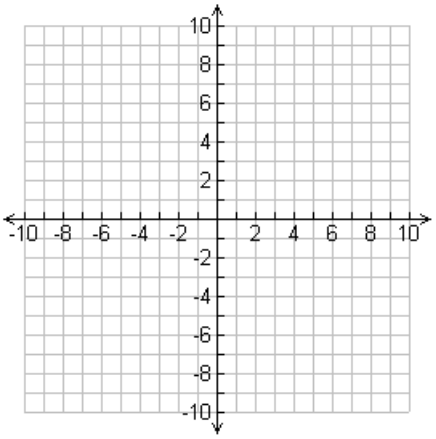
1) $\begin{cases} y = \frac{1}{2}x + 2 \\ y = -\frac{2}{3}x + 9 \end{cases}$



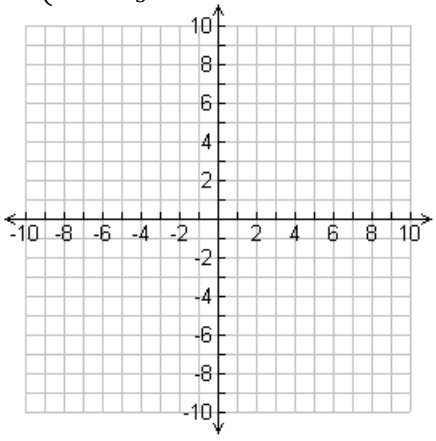
2) $\begin{cases} y = 2x - 8 \\ y = -3x + 7 \end{cases}$



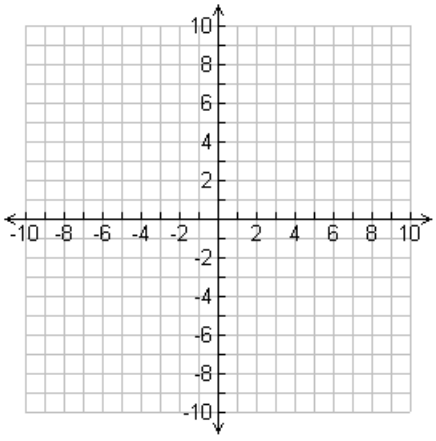
3) $\begin{cases} y = x + 5 \\ y = 4x - 7 \end{cases}$



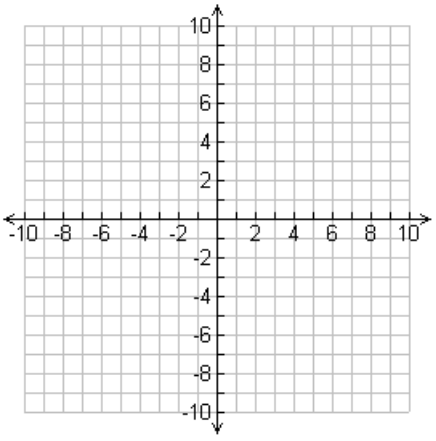
4) $\begin{cases} y = \frac{1}{2}x + 8 \\ y = -\frac{1}{3}x + 3 \end{cases}$



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



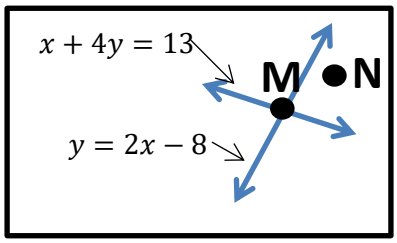
6) $\begin{cases} y = -\frac{5}{2}x \\ y = -4x + 6 \end{cases}$



7) Choose one of the systems from #1-6 and check your solution by plugging both numbers into both equations.

8) Which of the possibilities could be point **M?** Which could be point **N?**

A. (9, 1)
B. (5, 2)
C. (6, 4)
D. (7, 3)

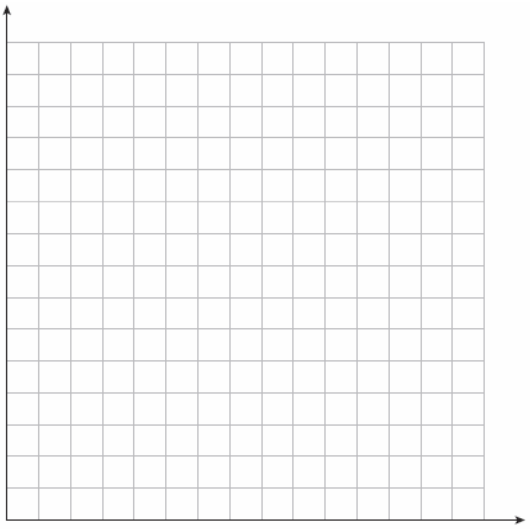


9) Creative Crafts gives scrapbooking lessons for $15 per hour plus a $20 supply charge. Scrapbooks Incorporated gives lessons for $20 per hour with no additional charges.

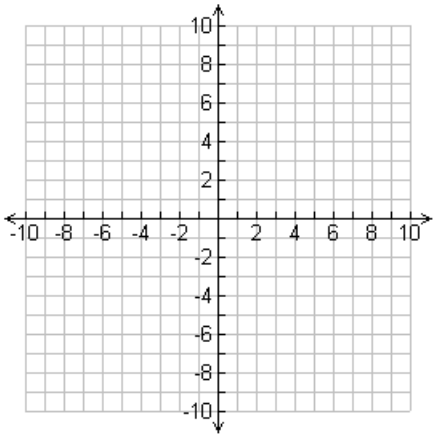
a) Write an equation for each situation where **x** is the number of hours and **y** is the total cost.

b) Graph both equations. Hint: you will need to scale your y-axis by more than 1.

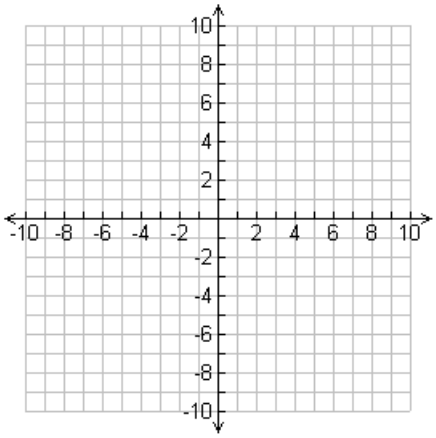
c) Write the point of intersection, and <u>explain what both of these numbers mean</u> in the context of the problem.



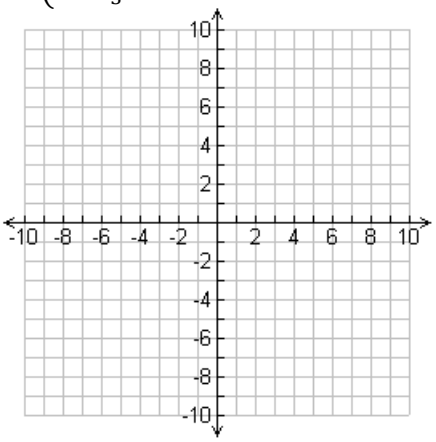
10) $\begin{cases} y = 3x - 2 \\ y = -\frac{2}{3}x - 2 \end{cases}$



11) $\begin{cases} y = 6 \\ y = 3x - 9 \end{cases}$

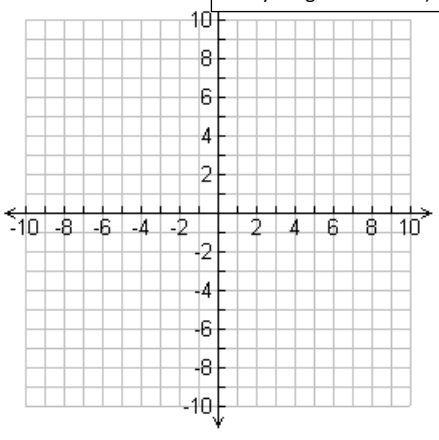


12) $\begin{cases} y = \frac{2}{3}x + 4 \\ y = \frac{2}{3}x + 1 \end{cases}$

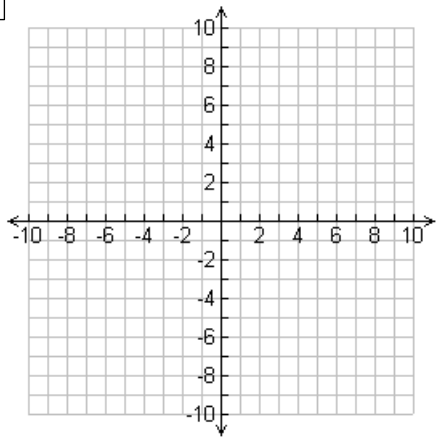


13) $\begin{cases} x + y = 8 \\ y = \frac{3}{2}x - 7 \end{cases}$

(For help on how to graph the "standard form" equations, look at "step 2" in the example on the front or the back side of your guided notes!)



14) $\begin{cases} 3x + 4y = 24 \\ y = x - 1 \end{cases}$



15) $\begin{cases} 5x + 3y = 30 \\ 10x - 2y = 20 \end{cases}$