Lesson Summary

A *system of linear equations* is a set of two or more linear equations. When graphing a pair of linear equations in two variables, both equations in the system are graphed on the same coordinate plane.

A *solution to a system of two linear equations in two variables* is an ordered pair of numbers that is a solution to both equations. For example, the solution to the system of linear equations $\begin{cases} x+y=6 \\ x-y=4 \end{cases}$ is the ordered pair $(5, 1)$ because substituting 5 in for x and 1 in for y results in two true equations: $5+1=6$ and $5-1=4$.

Systems of linear equations are notated using brackets to group the equations, for example: $\begin{cases} y=\frac{1}{8}x+\frac{5}{2} \\ y=\frac{4}{25}x \end{cases}$.

Problem Set

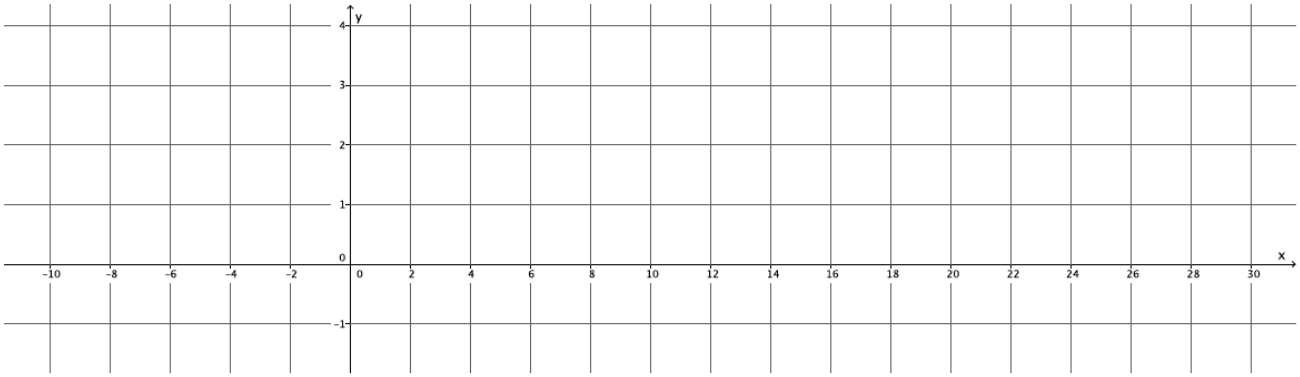
1. Jeremy and Gerardo run at constant speeds. Jeremy can run 1 mile in 8 minutes, and Gerardo can run 3 miles in 33 minutes. Jeremy started running 10 minutes after Gerardo. Assuming they run the same path, when will Jeremy catch up to Gerardo?

   a. Write the linear equation that represents Jeremy's constant speed.

   b. Write the linear equation that represents Gerardo's constant speed. Make sure to include in your equation the extra time that Gerardo was able to run.

   c. Write the system of linear equations that represents this situation.

   d. Sketch the graphs of the two equations.

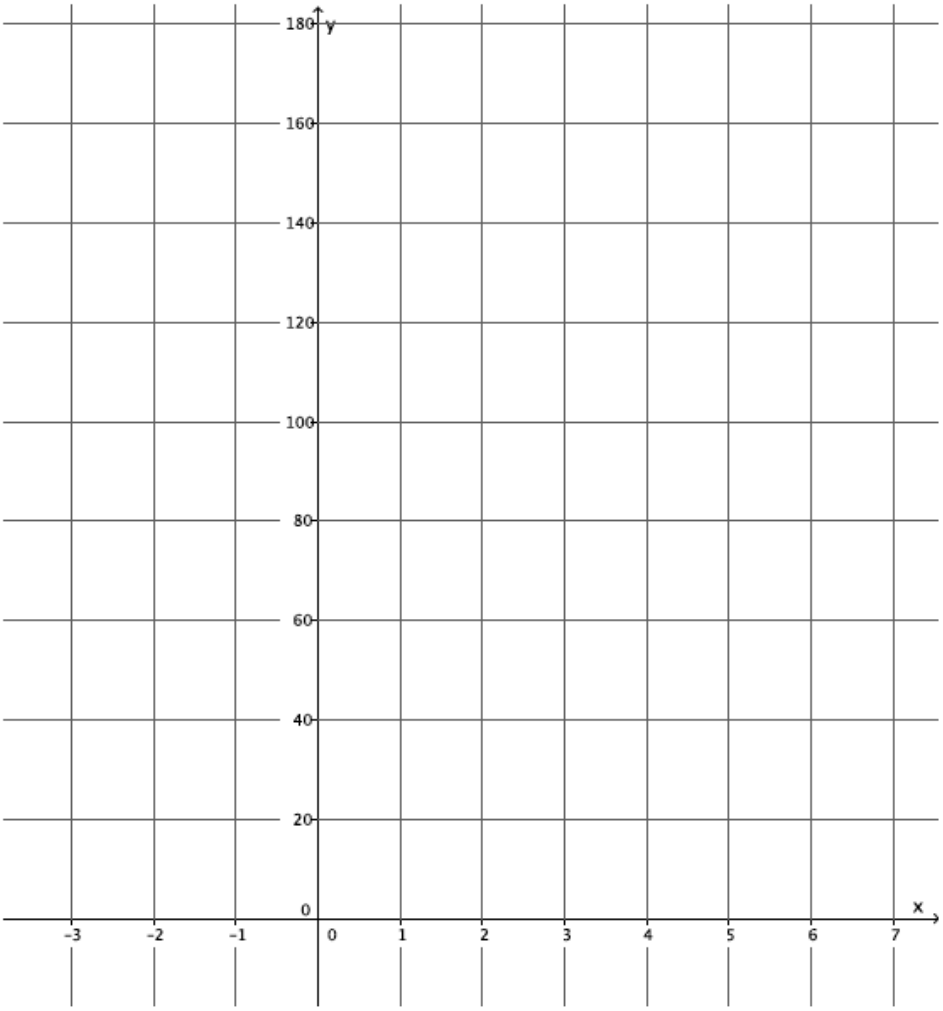


   e. Will Jeremy ever catch up to Gerardo? If so, approximately when?

   f. At approximately what point do the graphs of the lines intersect?

2. Two cars drive from town A to town B at constant speeds. The blue car travels 25 miles per hour, and the red car travels 60 miles per hour. The blue car leaves at 9:30 a.m., and the red car leaves at noon. The distance between the two towns is 150 miles.

   a. Who will get there first? Write and graph the system of linear equations that represents this situation.



   b. At approximately what point do the graphs of the lines intersect?