

## System of Equations Word Problems (Graphs)

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.

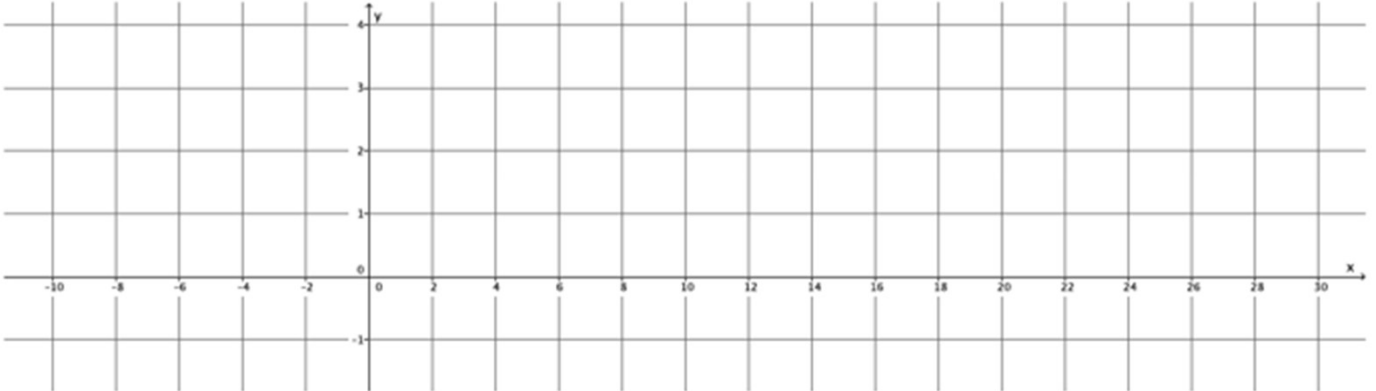
a) Write the linear equation that represents Jeremy's constant speed.

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.

## System of Equations Word Problems (Graphs)

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?

## System of Equations Word Problems (Graphs)

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

Jeremy's rate is  $\frac{1}{8}$  miles per minute. If he runs  $y$  miles in  $x$  minutes, then  $y = \frac{1}{8}x$ .

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.

Gerardo's rate is  $\frac{3}{33}$  miles per minute, which is the same as  $\frac{1}{11}$  miles per minute.

If he runs  $y$  miles in  $x$  minutes, then  $y = \frac{1}{11}x$ . To account for the extra time that Gerardo gets to run, we write the equation.

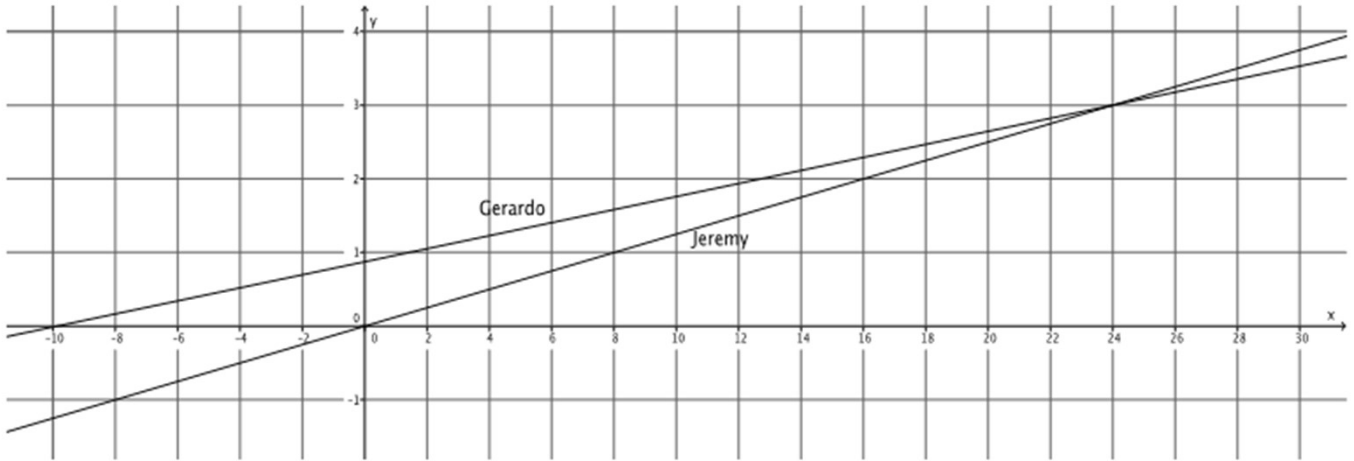
$$y = \frac{1}{11}(x + 10)$$
$$y = \frac{1}{11}x + \frac{10}{11}$$

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

$$\begin{cases} y = \frac{1}{8}x \\ y = \frac{1}{11}x + \frac{10}{11} \end{cases}$$

## System of Equations Word Problems (Graphs)

d) Sketch the graphs of the two equations.



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

*Yes, Jeremy will catch up to Gerardo after about 24 minutes or about 3 miles.*

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

*The lines intersect at approximately (24, 3).*