

Solving Systems of Equations with Substitution--No Context

Big Ideas: A "solution" to a set of linear equations (system) is where the lines cross (this is where they are equal). Substitution is best used when the equations are in slope-intercept form.

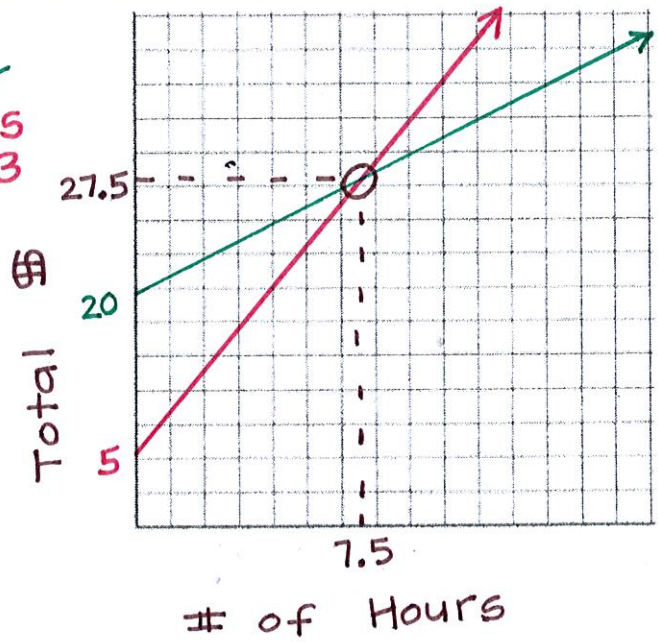
Example: The system of equations below have no context. Give them a context.

$\begin{cases} y = x + 20 \\ y = 3x + 5 \end{cases}$
 Gavin has \$20.
 He makes \$1 per hour.
 Rebecca has \$5.
 She makes \$3 per hour.

Find the "solution" to this system using substitution.

$$\begin{array}{r} x + 20 = 3x + 5 \\ -x \quad -x \\ \hline 20 = 2x + 5 \\ -5 \quad -5 \\ \hline 15 = 2x \\ \frac{15}{2} = \frac{2x}{2} \\ 7.5 = x \end{array} \quad \begin{array}{l} y = x + 20 \\ y = 7.5 + 20 \\ y = 27.5 \end{array}$$

Point of Intersection
 (7.5, 27.5)



Sketch a graph of this situation, labeling key points.