

# Digits 6-5 & 6-6 Solve Systems by Addition/Subtraction

Goal: I will be able to determine solutions of systems by addition and subtraction.

Example

$$\begin{array}{r} 5 + 3 = 8 \\ 7 - 2 = 5 \\ \hline 5 + 7 + 3 - 2 = 8 + 5 \quad ? \\ 12 + 1 = 13 \\ 13 = 13 \end{array}$$

Example

$$\begin{array}{r} x + y = -1 \\ 3x - y = 5 \quad \text{add} \\ \hline 4x = 4 \\ x = 1 \\ x + y = -1 \quad (1, -2) \\ 1 + y = -1 \\ y = -2 \end{array}$$

Don't forget to check

TRY

$$\begin{array}{r} 2y - 3x = 5 \\ 3y + 3x = 30 \\ \hline 2y + 3y - 3x + 3x = 5 + 30 \\ 5y = 35 \\ y = 7 \\ 2y - 3x = 5 \\ 2(7) - 3x = 5 \\ 14 - 3x = 5 \\ -3x = 5 - 14 \\ -3x = -9 \\ x = 3 \end{array}$$

FLIX

$$\begin{array}{r} 5 + 3 = 8 \\ 4 + 2 = 6 \quad \text{Subtract} \\ \hline 5 - 4 + 3 - 2 = 8 - 6 \\ 1 + 1 = 2 \\ \text{Yes it works!} \end{array}$$

Example

$$\begin{array}{r} 2x + y = 10 \\ x + y = 7 \quad \text{Subtract} \\ \hline 2x - x + y - y = 10 - 7 \\ x = 3 \\ x + y = 7 \\ 3 + y = 7 \\ y = 4 \end{array}$$

Don't forget to check

TRY

$$\begin{array}{r} 6y + 3x = 12 \\ 4y + 3x = 20 \quad \text{Subtraction} \\ \hline 6y - 4y + 3x - 3x = 12 - 20 \\ 2y = -8 \\ y = -4 \\ 4y + 3x = 20 \\ 4(-4) + 3x = 20 \\ -16 + 3x = 20 \\ 3x = 20 + 16 \\ 3x = 36 \\ x = 12 \\ y = -4 \quad x = 12 \end{array}$$

Don't forget to check

Example

292 tickets were sold. Adult ticket is \$3. A youth ticket is \$1. They made \$470.

$a = \text{adult}$   
 $b = \text{youth}$

$$\begin{array}{r} a + b = 292 \\ 3a + b = 470 \\ \hline a + b = 292 \quad \text{Subtract} \\ 3a - a + b - b = 470 - 292 \\ 2a = 178 \\ a = 89 \end{array}$$

$$\begin{array}{r} a + b = 292 \\ 89 + b = 292 \\ 89 - 89 + b = 292 - 89 \\ b = 203 \end{array}$$

Example

$$\begin{array}{r} 2x + 3y = 10 \\ 3x + y = 8 \\ \hline 9x + 3y = 24 \\ 2x + 3y = 10 \\ \hline 9x - 2x + 3y - 3y = 24 - 10 \\ 7x = 14 \\ x = 2 \\ 3x + y = 8 \\ 3(2) + y = 8 \\ 6 + y = 8 \\ y = 2 \end{array}$$

(2, 2)