

SOLVING EQUATIONS

- One Step Equations ➡ Isolate the variable by doing the opposite on both sides of the equal sign.

Example 1: The opposite of adding 4 is subtracting 4.

$$\begin{array}{r} x + 4 = 7 \\ \underline{-4 \quad -4} \\ x = 3 \end{array}$$

Example 2: The opposite of subtracting 8 is adding 8.

$$\begin{array}{r} x - 8 = 15 \\ \underline{+8 \quad +8} \\ x = 23 \end{array}$$

Example 3: The opposite of multiplying 5 is dividing 5.

$$\begin{array}{l} 5x = 15 \\ \frac{5}{5}x = \frac{15}{5} \\ x = 3 \end{array}$$

Example 4: The opposite of dividing -3 is multiplying -3

$$\begin{array}{l} \frac{x}{-3} = -8 \\ (-3)\frac{x}{-3} = -8 \cdot (-3) \\ x = 24 \end{array}$$

- *With Fractions ➡ Multiply both sides by the reciprocal of the coefficient of x .

Example 5:

$$\begin{array}{l} \frac{2}{5}x = 10 \\ \frac{5}{2} \cdot \frac{2}{5}x = 10 \cdot \frac{5}{2} \end{array} \quad \rightarrow \quad \begin{array}{l} x = \frac{10}{1} \cdot \frac{5}{2} \\ x = \frac{50}{2} \\ x = 25 \end{array}$$

- Two Step Equations ➡ Isolate the x by:

1. Moving the constant to the other side of the equal sign.
2. Getting rid of the coefficient on the variable.

Example 1:

$$\begin{array}{r} 5x - 7 = 13 \\ \downarrow \quad +7 \quad +7 \\ 5x = 20 \\ \frac{5x}{5} = \frac{20}{5} \\ x = 4 \end{array}$$

Example 2:

$$\begin{array}{r} \frac{1}{2}x - 8 = 3 \\ \underline{+8 \quad +8} \\ \frac{1}{2}x = 11 \\ \frac{2}{1} \cdot \frac{1}{2}x = \frac{11}{1} \cdot \frac{2}{1} \\ x = 22 \end{array}$$