

## SOLVING EQUATIONS

consider the equation

$$x + 3 = 7$$

As a word statement,  $x + 3 = 7$  translates to

We can use the Addition Property of Equality which states:

So to solve for  $x$ :

$$x + 3 = 7$$

$$x + 3 - 3 = 7 - 3$$

$$x + 0 = 4$$

$$x = 4$$

The vertical method:

$$x + 3 = 7$$

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

consider the equation

$$x + \frac{3}{2} = \frac{1}{3}$$

We can use the Multiplication Property of Equality which states

First we must identify the LCD.

$$\text{LCD} = \underline{\quad}$$

So, to solve for x:

$$6\left(x + \frac{3}{2}\right) = 6\left(\frac{1}{3}\right)$$

$$6x + 6\left(\frac{3}{2}\right) = 6\left(\frac{1}{3}\right)$$

$$6x + 9 = 2$$

We haven't solved for x yet, but at least we've eliminated the fractions!

To solve for x, we need to get rid of whatever is being added or subtracted to the variable term.

$$\begin{array}{r} 6x + 9 = 2 \\ -9 \quad -9 \\ \hline 6x = -7 \end{array}$$

Now we need to get rid of whatever is being multiplied or divided to the variable.

$$\begin{array}{r} \frac{6x}{6} = \frac{-7}{6} \\ x = -\frac{7}{6} \end{array}$$

↳ example 1: solve each equation:

a)  $2x + 1 = 5$

b)  $2x - 4 = 2$

$$c) \quad x - \frac{1}{9} = \frac{4}{3}$$

↳ example 2:

Is  $x=5$  a solution to the  
equation  $2x-4=6$  ?

↳ example 3: solve:

$$a) \quad x+3-7=4-6$$

$$b) \quad 6x-1-5x = -10+3$$

↳ example 4: solve:

$$-(x+4) + 2x - 3 = 9$$

## SOLVING EQUATIONS practice problems

Solve each equation:

1.  $x + 4 = 9$

2.  $x + \frac{1}{2} = \frac{3}{4}$

3.  $-7x + 4 + 8x = 9 - 12$

4.  $\frac{1}{4}x = \frac{2}{3}$

5.  $\frac{3}{4}t = \frac{5}{2} - \frac{1}{6}$

6.  $-\frac{3}{5}x = \frac{9}{15}$

7. Is  $x = -1$  a solution to the equation  
 $4x + 3 = 7$  ?