

Solving and Checking Solutions for Linear Equations (Practice)

Example 1

Solve the following equation for x:

$$3(2x - 12) = 7$$

$$\begin{array}{r} 6x - 36 = 7 \\ + 36 \quad + 36 \\ \hline \end{array}$$

$$\frac{6x}{6} = \frac{43}{6}$$

$$x = 7.1\overline{666666} \dots$$

$$x = 7.\overline{16}$$

$$x = \frac{43}{6} \checkmark$$

$$\cancel{x = 7\frac{1}{6}}$$

Example 2

Find the missing value for each ordered pair for the following equation:

$$y = 3x - 5$$

(x, y)

a. (2, 1)

$$y = 2 \cdot 3 - 5 = 6 - 5 = 1$$

b. (6, 13)

$$\begin{array}{r} 13 = 3x - 5 \\ +5 \quad \quad +5 \\ \hline \end{array}$$

$$\begin{array}{r} 18 = 3x \\ \frac{18}{3} = \frac{3x}{3} \\ 6 = x \end{array}$$

c. ($\frac{17}{3}$, 12)

$$\begin{array}{r} 12 = 3x - 5 \\ +5 \quad \quad +5 \\ \hline \end{array}$$

$$\frac{17}{3} = \frac{3x}{3}$$

$$x = \frac{17}{3}$$

Example 3

Solve the following equation for x:

$$\cancel{4} \left(\frac{(x+4)}{\cancel{4}} \right) = (16) \cancel{4}$$

$$\begin{array}{r} x+4 = 64 \\ -4 \quad -4 \\ \hline x = 60 \end{array}$$

Example 4

Find the missing value for each ordered pair for the following equation:

$$(x, y)$$

$$y = \frac{7}{x-7}$$

a. $(0, \underline{\quad})$

$$y = \frac{7}{0-7} = \frac{7}{-7} = -1$$

b. $(\underline{21}, \frac{1}{2})$

$$\frac{1}{2} = \frac{7}{x-7}$$

$$x-7 = 14$$

$$\begin{array}{r} +7 \\ +7 \\ \hline x = 21 \end{array}$$

c. $(7, \underline{\quad})$

$$\frac{56}{7}, 0$$

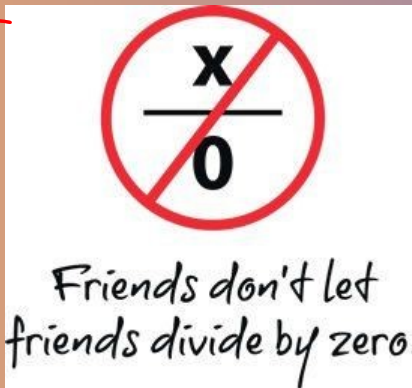
$$y = \frac{7}{7-7} = \frac{7}{0} \neq 0$$

No
Solution, $x \neq 7$

Why did one of our ordered pairs not work for the equation?

Solving Equations when the Denominator has a Variable

1. Remember that the in any case, We CANNOT divide by Zero!!!!



2. When dealing with equations that have a variable in the denominator, our first step is to find out what our variable can't be and discard it from our solutions. We do this by solving the denominator for zero.

Example

Solve the following equation for x .

$$x \neq 0$$

$$x \neq 2$$

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

$$\frac{-2}{2} = \frac{2x}{2}$$

$$\boxed{-1 = x} \quad \checkmark$$

Example

Solve the following equation for x.

$$x \neq -4 \quad \frac{(x+4)}{1} \left(\frac{x-1}{x+4} \right) = 6(x+4)$$

$$x-1 = 6(x+4)$$

$$x-1 = 6x+24$$

$$x = -5$$

$$x = 6x + 25$$

$$-6x \quad -6x$$

$$-5x = 25$$

$$\frac{-5x}{-5} = \frac{25}{-5}$$