



10.1

Date: _____

10.1 Modeling and Solving One Step Equations

What value of x would make each equation true?

$3x = 12$

$\frac{x}{3} = 5$

$x = 4$

$x = 15$

How can you check to make sure your answer is correct?

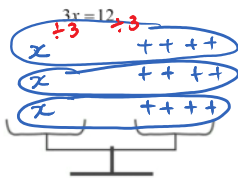
Substitute answers back to original
 LS $3x = 12$ RS
 $3(4) = 12$
 $12 = 12$ ✓

LS $\frac{x}{3} = 5$ RS
 $\frac{15}{3} = 5$
 $5 = 5$ ✓

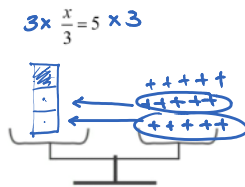
Solving by inspection is also called:

- guess and check
- trial and error

An equation can also be solved using a diagram:



$x = 4$



$x = 15$

Solving by inspection can become more difficult if the numbers don't work out nicely:

$$12x = 726$$

$$\div 12 \quad \div 12$$

$$x = 60.5$$

$$a \div 14 = 3.72$$

$$\times 14 \quad \times 14$$

$$a = 52.08$$

The best way to solve an equation is to apply the opposite process.

Example:

$$a) \frac{4x}{4} = \frac{8}{4}$$

$$x = 2$$

$$b) \frac{3x}{3} = \frac{-15}{3}$$

$$x = -5$$

$$c) 7a = 21$$

$$\div 7 \quad \div 7$$

$$a = 3$$

$$d) \frac{x}{4} = 2 \times 4$$

$$x = 8$$

$$e) \frac{a}{5} = -4 \times 5$$

$$a = -20$$

$$f) \frac{x}{2} = \frac{3}{4} \times 2$$

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

$$x = \frac{6}{4} = \frac{3}{2} = 1\frac{1}{2} = 1.5$$

$$g) \frac{x}{-2} = 7 \times -2$$

$$x = -14$$

$$h) \frac{-a}{3} = 3 \times 3$$

$$\times -1 \quad -a = 9 \times -1$$

$$a = -9$$

or


$$3 \times \frac{-a}{3} = 3 \times -3$$

$$a = -9$$

Examples:

Write an equation and solve using the opposite operation for each of the following:

The average temperature in Vancouver is twice as warm as the temperature in Toronto. If the temperature in Vancouver is 12°C , what is the temperature in Toronto?

$$\begin{aligned}v &= 2t \\ 12 \div 2 &= 2t \div 2 \\ 6 &= t\end{aligned}$$


$v = \text{Vancouver}$
 $t = \text{Toronto}$


The temperature in Toronto is 6° .

Alejandro is making bead necklaces. He has 144 beads which he will use to make 9 necklaces. How many beads are on each necklace?

$n = \# \text{ beads per necklace}$

$$\frac{9n}{9} = \frac{144}{9}$$
$$n = 16$$

16 beads per necklace.



How can you check to see if your answer is correct?

Solve:

$$\begin{aligned}6x &= -42 \\ \div 6 &\div 6 \\ x &= -7\end{aligned}$$

Check:

$$\begin{array}{ll} \text{LS} & \text{RS} \\ 6x &= -42 \\ 6(-7) &= -42 \\ -42 &= -42 \quad \checkmark \end{array}$$