Section 2-1: Solving One-Step Equations

To solve an equation means to find the value (or values) that make the equation TRUE when you replace the variables with that value.

What can I replace 's' with to make the left and right side of the = the same?

$$s+15=24$$

Too easy? That's a good thing!

If you can 'do this in your head'... practice these skills so you're ready for...

$$8(p-1)=6p+4+2p$$

To get an answer we can isolate the variable (get it by itself).

We can use the inverse operation of what is going on in the problem

Addition and Subtraction are inverses of one another

Multiplication and Division are inverses of one another

We also have rules (Properties) that tell us that we are allowed to:

1. Add any number to both sides of an equation
2. Subtract any number from both sides of an equation
3. Multiply any number...
4. Divide any number...

...except the number 0 (You can't divide by 0!)

$$s + 15 = 24$$

$$s + 15 - 15 = 24 - 15$$

0

$$s = 9$$

Example 1: Solve.

a. $x - 12 = 17$

$+12 \quad +12$

$x = 29$

b. $\frac{3t}{3} = \frac{27}{3}$

$t = 9$

c. $\frac{c}{4} = 16$

$\cdot 4 \quad \cdot 4$

$c = 64$

d. $6 = j + 2$

$j + 2 = 6$

$-2 \quad -2$

$j = 4$

e. $-5 + a = 21$

$+5 \quad +5$

$a = 26$

f. $-9 = \frac{q}{-9}$

$\frac{q}{-9} = -9$

$\cdot(-9) \quad \cdot(-9)$

$q = 81$

To "undo" a fraction that is multiplied by a variable, you can multiply both sides of the equation by the reciprocal of the fraction.

$$\frac{2}{3}y = 18$$

$$\frac{3}{2}\cdot\frac{2}{3}y = \frac{18}{1}\cdot\frac{3}{2}$$

$$y = 27$$

Example 2: Solve.

a. $\frac{3}{5}m = -15$

$\left(\frac{5}{3}\cdot\right)\ \frac{3}{5}m = \frac{-15}{1}\left(\cdot\frac{5}{3}\right)$

$m = -5 \cdot 5 = -25$

$m = -25$

b. $36 = \frac{4}{9}w$

$\left(\frac{9}{4}\cdot\right)\frac{4}{9}w = 36\left(\cdot\frac{9}{4}\right)$

$w = 9 \cdot 9 = 81$

$w = 81$