3.1 – "Solving One-Step Equations"

An **equation** is a number sentence involving an **equal sign**.
It may be true or false or open.
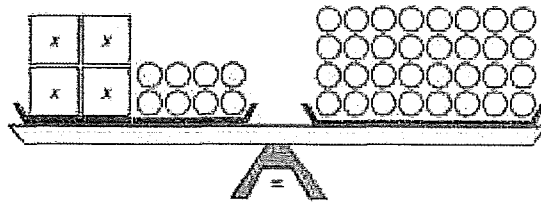
$10 - 3 = 7$ is a _____*True*_____ equation.

$15 \div 2 = 5$ is a _____*False*_____ equation.

$x - 4 = 8$ is an _____*open*_____ equation.

Finding the value of a variable that makes an **open sentence TRUE** is called
→ **SOLVING an EQUATION** or **Finding the ROOT of an EQUATION.**

What equation does the balance model below represent?

$$4x + 8 = 32$$

How could you figure out x using this model?

x should represent oooooo

(x = 6)

To SOLVE an equation, you want to determine what **VALUE** for the variable makes the equation **TRUE.**

THINK of "OPPOSITE OPERATIONS"!!!

What is the opposite operation of:

Addition   *Subtraction*

Subtraction   *Addition*

Multiplication   *Division*

Division   *Multiplication*

Exponent   *Depends on the power*

     $x^2 \rightarrow$ *square root*

     $x^3 \rightarrow$ *cube root*

Ex.1) Solve algebraically.

a) $x + 4 = 13$

$x = 13 - 4$

$x = 9$

b) $x - 8 = 2$

$x = 2 + 8$

$= 10$

c) $-4 + x = -1$

$x = -1 + 4$

$= 3$

d) $3y = 18$

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

$y = 6$

e) $\frac{n}{3} = -4$

$n = (-4)(3)$

$= -12$

f) $-v = 9$

$v = -9$

Solving Two-Step Equations

When solving a two-step or multi-step equation (tomorrow),
➜ do BEDMAS in reverse at **each step**.   **"SAMDEB"**

Ex. 2) Solve algebraically.

a) $2w + 1 = 11$

$2w = 11 - 1$

$2w = 10$

$w = \frac{10}{2}$

$w = 5$

b) $5n - 18 = 12$

$5n = 12 + 18$

$5n = 30$

$n = 6$

c) $3 - 2y = -7$

$-2y = -7 - 3$

$-2y = -10$

$y = 5$

d) $\frac{x}{4} + 1 = 11$

$\frac{x}{4} = 11 - 1$

$\frac{x}{4} = 10$

$x = 40$

e) $\frac{y}{3} - 3 = -6$

$\frac{y}{3} = -6 + 3$

$\frac{y}{3} = -3$

$y = -9$

f) $\frac{k + 2}{4} = -5$

$k + 2 = -20$

$k = -20 - 2$

$k = -22$.