

Section 2-2: Solving Two-Step Equations

$$\begin{array}{c} \text{addition} \\ \underbrace{2x + 11} = 51 \\ \underbrace{\quad \quad \quad} \\ \text{multiplication} \end{array}$$

We solve equations in REVERSE order of operations.

Think inverse is UNDO so work backwards in PEMDAS... SADMEP

$$2x + 11 = 51$$

$$\begin{array}{r} -11 \\ -11 \end{array}$$
$$2x = 40$$

$$\begin{array}{r} \frac{\quad}{2} \\ \frac{\quad}{2} \end{array}$$
$$x = 20$$

Example 1: Solve

a. $3n - 4 = 11$

$$\begin{array}{r} +4 \\ +4 \end{array}$$

$$\begin{array}{r} 3n = 15 \\ \frac{\quad}{3} \quad \frac{\quad}{3} \end{array}$$

$$n = 5$$

b. $\frac{y}{5} + 2 = -8$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

5' $\frac{y}{5} = -10$ '5

$$y = -50$$

c. $2 = \frac{a}{5} - 18$

$$\frac{a}{5} - 18 = 2$$

$$\frac{a}{5} = 20$$

$$a = 100$$

d. $14 = -2k + 3$

$$-2k + 3 = 14$$

$$-2k = 11$$

$$k = -\frac{11}{2}$$

$$\frac{x + 5}{6} = 15$$

Don't be confused by a "big fraction bar"

$$\frac{6}{1} \cdot \frac{x + 5}{6} = 15 \cdot 6$$

...the fraction bar is a grouping symbol which means whatever is on top or bottom is *secretly* in parentheses.

$$x + 5 = 90$$

$$x = 85$$

Example 2: Solve

a. $\frac{b + 3}{5} = -1$

$$b + 3 = -5$$

$$b = -8$$

b. $7 = \frac{x - 8}{3}$

$$\frac{x - 8}{3} = 7$$

$$x - 8 = 21$$

$$x = 29$$