

Two-Step Equations

Things to remember for 2-Step Equation

- (First) Simplify using the inverse of addition or subtraction.

- (Second) Simplify further by using the inverse of multiplication or division.

** Use the multiplicative inverse if variable is being multiplied by a fraction **

multiply
by
reciprocal

$$\begin{array}{l} 1) \quad 4Q + 4 = 20 \\ 4Q + 4 - 4 = 20 - 4 \\ \frac{4Q}{4} = \frac{16}{4} \end{array}$$

$$\boxed{Q = 4}$$

$$\begin{array}{l} 3) \quad \frac{Q}{3} + 4 = 8 \\ \frac{Q}{3} + 4 - 4 = 8 - 4 \end{array}$$

$$\begin{array}{l} 3 \cdot \frac{Q}{3} = 4 \cdot 3 \end{array}$$

$$\boxed{Q = 12}$$

$$\begin{array}{l} 2) \quad 6R - 5 = 37 \\ 6R - 5 + 5 = 37 + 5 \\ \frac{6R}{6} = \frac{42}{6} \end{array}$$

$$\boxed{R = 7}$$

$$\begin{array}{l} 4) \quad \frac{S}{3} + 8 = 11 \\ \frac{S}{3} + 8 - 8 = 11 - 8 \end{array}$$

$$\begin{array}{l} 3 \cdot \frac{S}{3} = 3 \cdot 3 \end{array}$$

$$\boxed{S = 9}$$

$$5) \frac{n}{3} + 6 = 8$$

$$\frac{n}{3} + 6 - 6 = 8 - 6$$

$$\cancel{3} \cdot \frac{n}{\cancel{3}} = 2 \cdot 3$$

$$\boxed{n = 6}$$

$$6) \frac{9+p}{8} = 2$$

$$\cancel{8} \cdot \frac{9+p}{\cancel{8}} = 2 \cdot 8$$

$$9+p = 16$$

$$9+p-9 = 16-9$$

$$\boxed{p = 7}$$

$$7) \frac{7+x}{2} = 2$$

$$\cancel{2} \cdot \frac{7+x}{\cancel{2}} = 2 \cdot 2$$

$$7+x-7 = 4-7$$

$$\boxed{x = -3}$$

* When every term is being divided by the denominator, multiply first to get rid of the denominator *

Two-Step Equations Continued...

- 8) You bought a magazine for \$5 and four erasers. You spent a total of \$25. How much did each eraser cost?

$e =$ cost of 1 eraser

$$5 + 4e = 25$$

$$5 + 4e - 5 = 25 - 5$$

$$\frac{4e}{4} = \frac{20}{4}$$

$$e = 5$$

- 9) Jill sold half of her comic books and then bought sixteen more. She now has 36. With how many did she begin? $c =$ # of comic books she began with

$$\frac{c}{2} + 16 = 36$$

$$\frac{c}{2} + 16 - 16 = 36 - 16$$

$$2 \cdot \frac{c}{2} = 20 \cdot 2$$

$$c = 40$$