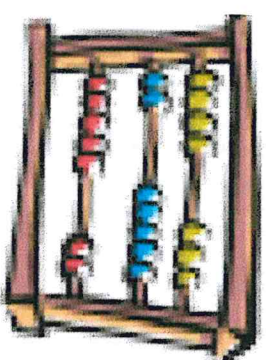


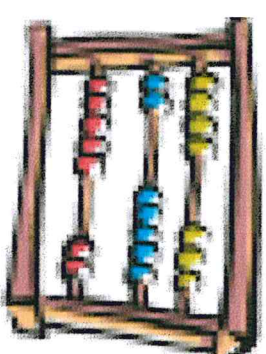
Goals



Goal

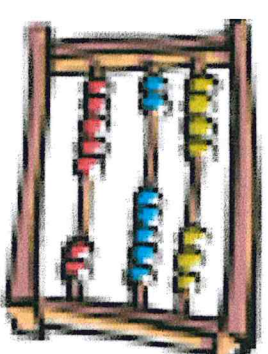
- To rewrite and use literal equations and formulas.

Vocabulary



- Literal Equation
- Formula

Solving a Literal Equation



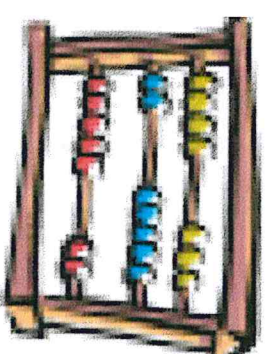
Solving for a Variable

Step 1 Locate the variable you are asked to solve for in the equation.

Step 2 Identify the operations on this variable and the order in which they are applied.

Step 3 Use inverse operations to undo operations and isolate the variable.

Definition

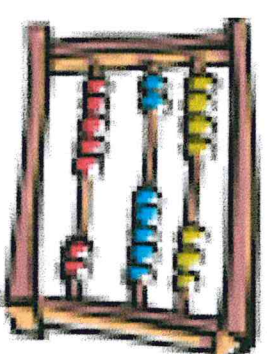


- *Literal Equation* – an equation with two or more variables.
 - You can "rewrite" a literal equation to isolate any one of the variables using inverse operations. This is called *solving for a variable*.
 - When you rewrite literal equations, you may have to divide by a variable or variable expression. In this lesson, assume that the variable or variable expression is not equal to zero. Division by zero is not defined.

- Examples:

$$x = \frac{b-c}{a}, \quad z = \frac{2}{5}xy + 3$$

Example: Solving Literal Equations



A. Solve $x + y = 15$ for x .

$$x + y = 15$$

$$\underline{-y} \quad \underline{-y}$$

$$x = -y + 15$$

Locate x in the equation.

Since y is added to x , subtract y from both sides to undo the addition.

B. Solve $pq = x$ for q .

$$pq = x$$

$$\underline{p}q = \underline{p}x$$

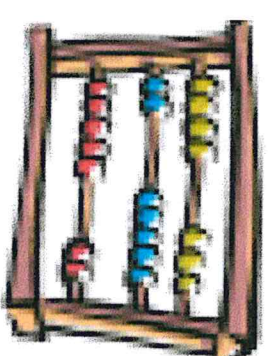
$$q = \frac{x}{p}$$

$$q = \frac{x}{p}$$

Locate q in the equation.

Since q is multiplied by p , divide both sides by p to undo the multiplication.

Your Turn:



Solve $5 - b = 2t$ for t .

$$5 - b = 2t$$

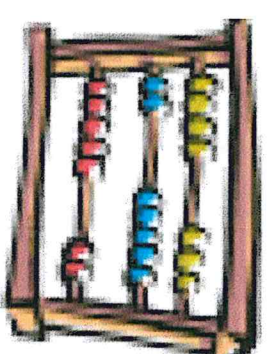
Locate t in the equation.

$$\frac{5 - b}{2} = \frac{2t}{2}$$

Since t is multiplied by 2, divide both sides by 2 to undo the multiplication.

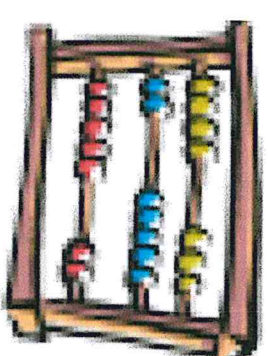
$$\frac{5 - b}{2} = t$$

Definition



- *Formula* – is an equation that states a rule for a relationship among quantities.
 - A formula is a type of *literal equation*.
 - In the formula $d = rt$, d is isolated. You can "rearrange" a formula to isolate any variable by using inverse operations.
- Examples:
 - Circumference: $C = 2\pi r$
 - Area of Triangle: $A = 1/2bh$

Your Turn:



Solve $D = \frac{m}{V}$ for V

$$D = \frac{m}{V}$$

Locate V in the equation.

$$V(D) = V \frac{m}{V}$$

Since m is divided by V , multiply both sides by V to undo the division.

$$VD = m$$

$$\frac{VD}{D} = \frac{m}{D}$$

Since V is multiplied by D , divide both sides by D to undo the multiplication.

$$V = \frac{m}{D}$$

LITERAL EQUATIONS WORKSHEET

Solve for the indicated variable in the parenthesis ON A SEPARATE SHEET OF PAPER!

1) $P = IRT$ (T)

2) $A = 2(L + W)$ (W)

5) $\frac{x+y}{3} = 5$ (x)

6) $y = mx + b$ (b)

9) $V = LWH$ (L)

10) $A = 4r^2$ (r^2)

13) $A = \frac{x+y}{2}$ (y)

14) $R = \frac{E}{I}$ (I)

17) $A = \frac{a+b+c}{3}$ (b)

18) $12x - 4y = 20$ (y)

LITERAL EQUATIONS WORKSHEET

Solve for the indicated variable in the parenthesis ON A SEPARATE SHEET OF PAPER!

1) $P = IRT$ (T)

$$\frac{P}{IR} = \frac{IRT}{IR}$$

$$\boxed{\frac{P}{IR} = T}$$

2) $A = 2(L + W)$ (W)

$$\frac{A}{2} = \frac{2(L+W)}{2}$$

$$\frac{A}{2} = L + W$$

$$\boxed{\frac{A}{2} - L = W}$$

5) $\frac{x+y}{3} = 5$ (x)

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

$$x+y = 15$$

$$-y \quad -y$$

$$\boxed{x = 15 - y}$$

6) $y = mx + b$ (b)

$$y - mx = b$$

9) $\frac{V}{WH} = \frac{LWH}{WH}$ (L)

$$\boxed{\frac{V}{WH} = L}$$

10) $\frac{A}{4} = \frac{4r^2}{4}$ (r^2)

$$\boxed{\frac{A}{4} = r^2}$$

13) $A = \frac{x+y}{2}$ (y)

$$2A = \frac{x+y}{2} \cdot 2$$

$$2A = x + y$$

$$\boxed{2A - x = y}$$

14) $R = \frac{E}{I}$ (I)

$$IR = \frac{E}{I} \cdot I$$

$$\boxed{IR = E}$$

17) $A = \frac{a+b+c}{3}$ (b)

$$3A = \frac{a+b+c}{3} \cdot 3$$

$$3A = a + b + c$$

$$-a \quad -a$$

$$3A - a = b + c$$

$$-c \quad -c$$

$$\boxed{3A - a - c = b}$$

18) $12x - 4y = 20$ (y)

$$-4y = -12x + 20$$

$$-4y = -12x + 20$$

$$-4y = -12x + 20$$

$$\boxed{y = 3x - 5}$$

SIMPLIFY