



## LESSON 4.3 LITERAL EQUATIONS

Goal: To solve equations/inequalities in math and real world context and to write rules for arithmetic sequence.

Obj: SWBAT solve literal equations.

## PROBLEM 1:

To find the volume of a rectangular prism we use the formula  $V = lwh$  with length  $l$ , width  $w$  and height  $h$ . Solve the formula for  $h$ .

$$\frac{V}{lw} = \frac{lwh}{lw}$$

Do $h$	Undo $h$
$\cdot lw$	$\div lw$

↑



$$\frac{V}{lw} = h$$

**PROBLEM 2:**

The formula for the perimeter  $P$  of a triangle with sides of length  $a, b, c$  is  $P = a + b + c$ . Solve for formula for  $c$ .

$$P = a + b + c$$

~~$-a$~~     ~~$-a$~~

$$P - a = b + c$$

~~$-b$~~     ~~$-b$~~

$$P - a - b = c$$

Do $c$	Undo $c$
$+b$	$-b \checkmark$
$+a$	$-a \checkmark$

↑



**PROBLEM 3:**

The formula for the volume of a cylinder of radius  $r$  and height  $h$  is  $V = \pi r^2 h$ . Solve the formula for  $h$ .

$$\frac{V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$$

Do $h$	Undo $h$
$\cdot \pi r^2$	$\div \pi r^2$

↑



$$\frac{V}{\pi r^2} = h$$

**PROBLEM 4:**

Solve each literal equation for the indicated variable.

$ax - b = c$ , Solve for  $x$ .

$$ax - b = c$$

~~$-b$~~     $+b$     $+b$

$$\frac{ax}{a} = \frac{c+b}{a}$$

$$x = \frac{c+b}{a}$$

Do $x$	Undo $x$
$\bullet a$	$\div a$ ✓
$-b$	$+b$ ✓

↑

**PROBLEM 5:**

Solve each literal equation for the indicated variable.

$y = mx + b$ , Solve for  $m$ .

$$y = mx + b$$

$-b$                        $-b$

$$\frac{y - b}{x} = \frac{mx}{x}$$

$$\frac{y - b}{x} = m$$

Do $m$	Undo $m$
$\cdot x$	$\div x$
$+b$	$-b$

$\uparrow$

### PROBLEM 6:

The formula  $E = \frac{1}{2} kx^2$  is used to find the potential energy E of a springs with spring constant k that has been stretched by length x. Solve the formula for k.



$$E = \frac{1}{2} kx^2$$

$\frac{\quad}{x^2} \quad \frac{\quad}{\cancel{x^2}}$

Do k	Undo k
$\cdot \frac{1}{2}$	$\cdot 2$
$\cdot x^2$	$\div x^2 \checkmark$

    

2.  $\frac{E}{x^2} = \frac{1}{2} k$

$$\frac{2E}{x^2} = k$$

**PROBLEM 8:**

Solve each literal equation for the indicated variable.

$$A = \frac{1}{3}bc. \text{ Solve for } b.$$

$$A = \frac{1}{3}bc$$

$$3 \cdot \frac{A}{c} = \frac{1}{3}b \cdot 3$$

$$\frac{3A}{c} = b$$

Do b	Undo b
$\cdot \frac{1}{3}$	$\cdot 3$ ✓
$\cdot c$	$\div c$ ✓



**PROBLEM 9:**

Solve each literal equation for the indicated variable.

$$V = \frac{lwh}{3}. \text{ Solve for } w.$$

## PROBLEM 10:

Dean is painting a playground tunnel red. The Surface area formula for the tunnel is  $S = 2\pi r l$ , where  $r$  is the radius,  $l$  is the length and  $S$  is the surface area. Solve the formula for  $l$ .

## PROBLEM 11:

The formula for the surface area of a cylinder is  $S = 2\pi r^2 + 2\pi rh$ .  
Rewrite the formula in terms of  $h$ .

## PROBLEM 12:

Rewrite the formula for Density  $D = \frac{m}{V}$  in terms of  $V$ .

### **PROBLEM 13:**

Solve each literal equation for the indicated variable.

$$a(x + b) = c, \text{ where } a \neq 0 \text{ for } x$$

**PROBLEM 14:**

Solve each literal equation for the indicated variable.

$$A = \frac{1}{2}h(b_1 + b_2) \quad \text{Solve for } b_1$$