Essential Question: How do we solve formulas and literal equations for a variable?

Do Now:

1) Solve for the variable.

a) $x + 8 = 4$
$-8 \quad -8$
$\overline{}$
$x = -4$

b) $\dfrac{20}{4} = \dfrac{4s}{4}$

$5 = s$

2) Solve for x.

$\boxed{x} + y = 4$
$-y \quad -y$
$\overline{}$
$x = 4 - y$

3) Solve for s.

$\dfrac{P}{4} = \dfrac{4s}{4}$

$\dfrac{P}{4} = s$

Literal Equation: __an equation that contains 2 or more variables.__

Transform each given formula by solving for the indicated variable. State the property/properties used.

1) $A = bh$ for h
$\dfrac{A}{b} = \dfrac{bh}{b}$
÷ prop of equality
$\boxed{\dfrac{A}{b} = h}$

2) $V = lwh$ for l
$\dfrac{V}{wh} = \dfrac{lwh}{wh}$
÷ prop of equality
$\boxed{\dfrac{V}{wh} = l}$

> Remember to use inverse operations!

3) $P = 2a + b$ for b
$-2a \quad -2a$
$\overline{}$
— prop of equality
$\boxed{P - 2a = b}$

4) $P = 2l + 2w$ for w
$-2l \quad -2l$
$\overline{}$
$\dfrac{P - 2l}{2} = \dfrac{2w}{2}$
— prop of equality
÷ prop of equality
$\boxed{\dfrac{P - 2l}{2} = w}$

5) $V = \frac{1}{3}Bh$ for $\boxed{B}$ in terms of $\underline{V}$ and $\underline{h}$

$$3 \cdot V = 3 \cdot \frac{1}{3}\boxed{B}h$$

$$\frac{3V}{h} = \frac{\boxed{B}h}{h}$$

$$\frac{3V}{h} = B$$

It's Your Turn Now!

7) Solve for x:

a) $\frac{a\boxed{x}}{a} = \frac{7}{a}$

$$x = \frac{7}{a}$$

b) $2a + \boxed{x} = 6$

$\quad -2a \quad\quad -2a$

$$x = 6 - 2a$$

c) $a\boxed{x} + n = m$

$\quad\quad -n \quad -n$

$$\frac{a\boxed{x}}{a} = \frac{m-n}{a}$$

$$x = \frac{m-n}{a}$$

8) Solve $S = \frac{1}{2}g\boxed{t}$ for t in terms of $\underline{S}$ and $\underline{g}$

$$2 \cdot S = 2 \cdot \frac{1}{2}g\boxed{t}$$

$$\frac{2S}{g} = \frac{g\boxed{t}}{g}$$

$$\frac{2S}{g} = t$$

6) $F = \frac{9}{5}\boxed{C} + 32$ for C in terms of $\underline{F}$

$$F = \frac{9}{5}\boxed{C} + 32$$

$\quad -32 \quad\quad\quad -32$

$$\frac{5}{9}\left(F - 32\right) = \frac{5}{9} \cdot \frac{9}{5}\boxed{C}$$

$$\frac{5}{9}(F-32) = \boxed{C}$$

or $\quad \frac{5(F-32)}{9} = C$

9) $C = 2\pi r$ for r in terms of $\underline{C}$ and $\underline{\pi}$

$$\frac{C}{2\pi} = \frac{2\pi\boxed{r}}{2\pi}$$

$$\frac{C}{2\pi} = r$$

The TAKE AWAY

How can you solve a literal equation for a given variable?

- Use the properties of ____equality____ .
- Treat the ___variables___ you are not solving for in the literal equation as if they were ___numbers (constants)___