

AChar/MFM2P

Name: _____

Date: _____

Worksheet 5-6: Solving Literal Equations/Rearranging Formulas

Literal equations are equations containing **two or more variables**.

Your goal is to solve for just one variable with respect to others **i.e.** isolate the specified variable by rearranging the other terms following the steps below.

Important: When there is more than one variable term,

- **Clear fractions** by multiplying **each** side with the **common denominator**
- **Expand the brackets** if they exist
- **Collect the like terms** that are on the **same** side of the equation
- **Combine** the variable terms on **one side** of the equation
- **Combine** the constant terms (terms with only numbers) on the **other** side of the equation

1. Rearrange each formula to solve for the indicated variable.

(a) Solve $y = mx + b$ for x .

$$y - b = mx$$

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

(b) Solve $d = st$ for s .

$$\frac{d}{t} = s$$

(c) Solve $w = u + at^2$ for a .

$$w - u = at^2$$

$$\frac{w - u}{t^2} = a$$

(d) Solve $A = P(1 + rt)$ for t .

$$A - P = Prt$$

$$\frac{A - P}{Pr} = t$$

(e) Solve $A = \frac{bh}{2}$ for h .

$$2(A) = 2\left(\frac{bh}{2}\right)$$

$$\frac{2A}{b} = h$$

(f) Solve $y = mx + b$ for b .

$$y - mx = b$$

$$P = 2(l + w)$$

$$l = ?$$

$$P = 2l + 2w$$

$$\frac{P - 2w}{2} = \frac{2l}{2}$$

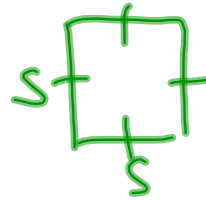
$$\frac{P - 2w}{2} = l$$

$$l = \frac{P - 2w}{2}$$

$$l = \frac{P}{2} - \frac{2w}{2}$$

$$l = \frac{P}{2} - w$$

$$A = S^2$$



$$S = ?$$

$$A = S \times S$$

$$A = S^2$$

$$S = \sqrt{A}$$

square root is the opposite of squaring.

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2. Rearrange each formula to solve for the indicated variable.

(a) Solve $P = 2(l + w)$ for l .

(b) Solve $C = 2\pi r$ for r .

3. Describe in complete English sentences the steps required to rearrange each formula to obtain the form shown below.

(a) $V = \frac{V}{ad}$ to $t = \frac{V}{ad}$

Isolate t by dividing both sides with ad .

(b) $E = mc^2$ to $m = \frac{E}{c^2}$

Isolate m by dividing both sides with c^2 .

(c) $s = \frac{w - 10e}{t}$ to $e = \frac{st - w}{-10}$

$s = \frac{w - 10e}{t}$
 $t(s) = t(w - 10e)$
 $st = w - 10e$
 $st - w = -10e$
 $\frac{st - w}{-10} = \frac{-10e}{-10}$
 $\frac{st - w}{-10} = e$

1. Clear fraction by multiplying both sides by t .

2. Isolate $10e$ by subtracting w from both sides.

3. Isolate e by dividing both sides with -10 .

Answers 1. (a) $x = \frac{y - b}{m}$, (b) $s = \frac{d}{t}$, (c) $a = \frac{w - u}{t^2}$, (d) $t = \frac{A - P}{Pr}$, (e) $h = \frac{2A}{b}$, (f) $b = y - mx$;

2. (a) $l = \frac{P - 2w}{2}$, (b) $r = \frac{C}{2\pi}$