Algebra 1
Unit 2, Lesson 4: Solving Literal Equations

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

Vocabulary:

Literal Equation	Formula
An equation containing mostly variables.	An equation that relates 2+ quantities.

Literal Equations

1) Solve for **x**:

$$x + k = f$$
$$-k \qquad -k$$
$$\boxed{x = f - k}$$

2) Solve for **a**:

$$\times \quad \frac{a}{x} = b \times$$
$$\boxed{a = bx}$$

3) Solve for **m**:

$$x - m = r$$
$$-x \qquad -x$$
$$-m = r - x$$
$$\boxed{m = -r + x}$$

4) Solve for **z**:

$$x + z = r$$
$$-x \qquad -x$$
$$\boxed{z = r - x}$$

5) Solve for **x**:

$$\frac{x}{a} - b = c$$
$$+b \qquad +b$$
$$\frac{x}{a} = c + b$$
$$\boxed{x = a(c+b)}$$
cr

6) Solve for **x**:

$$ax - t = m$$
$$+t \qquad +t$$
$$\frac{ax}{a} = \frac{m+t}{a}$$
$$\boxed{x = \frac{m+t}{a}}$$

7) Solve for **y**. Then find the value of **y** when $x = -5$.

$$y + 3x = -11$$

$$\boxed{y = -3x - 11}$$

$$y = -3(-5) - 11$$
$$y = 15 - 11$$
$$\boxed{y = 4}$$

8) Solve for **y**. Then find the value of **y** when $x = 6$.

$$3y - 6x = -9$$

$$3y = 6x - 9$$

$$\boxed{y = 2x - 3}$$

$$y = 2(6) - 3$$
$$y = 12 - 3$$
$$\boxed{y = 9}$$

9) Solve for **y**. Then find the value of **y** when $x = 2$.

$$6 = -2y + 5x$$

$$2y = 5x - 6$$

$$\boxed{y = \frac{5}{2}x - 3}$$

$$y = \frac{5}{2}(2) - 3$$

$$y = 5 - 3$$
$$\boxed{y = 2}$$

Formulas:

1) Solve for **b**: $A = \frac{1}{2}bh$ (Area of a triangle)

$$2A = bh$$

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

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

2) Solve for **r**: $C = 2\pi r$ (Circumference of a circle)

$$\frac{C}{2\pi} \quad \frac{}{2\pi}$$

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

3) Solve for **W**: $P = 2L + 2W$ (Perimeter of a rectangle)

$$\frac{P - 2L}{2} = \frac{2W}{2}$$

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

4) Solve for **t**: $D = rt$ (Linear motion)

$$\frac{}{r} \quad \frac{}{r}$$

$$\boxed{t = \frac{D}{r}}$$

5) Solve for **C**: $F = \frac{9}{5}C + 32$ (Temperature conversions)

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

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

$$\boxed{C = \frac{5F - 160}{9}}$$