3.8: Rewrite Equations and Formulas

Goals: *Isolate a variable in a literal equation

*Rewrite an equation so it is in function form

Literal equation: an equation in which coefficients and constants have been replaced by letters
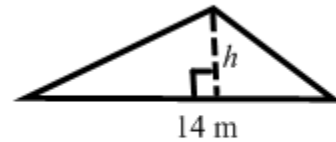
Ex: Solve $ax + b = c$ for x This means to: isolate x

Solve the following equations for the given variable.

Ex: Solve $A = \frac{1}{2}bh$ for h

$2A = bh$ To get rid of ½ multiply by 2

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

Find h if the shown triangle has an area of 64.4 m²

14 m

Plug in A and b into new equation. Plug numbers to solve for h

$$\frac{2(64.4)}{14} = h$$

$$\frac{128.8}{14} = h$$

$$9.2 \text{ m} = h$$

Ex: $p + qx = r$ for x

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

Ex: $A = lw$ for l, then find l if A = 351 cm² and w = 13 cm

$\frac{A}{w} = l$

$\frac{351}{13} = l$ $l = 27$ cm

Ex: You are visiting Toronto over the weekend and look up a weather forecast. Find the low temperatures for Saturday and Sunday in degrees Fahrenheit. First rewrite the conversion formula so F is isolated:

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

	Friday	Saturday	Sunday
Forecast	Sunny	Sunny	Partly Cloudy
High	$21°C$	$22°C$	$16°C$
Low	$13°C$	$14°C$	$10°C$

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

Saturday

$$\frac{9}{5} \cdot 14 + 32 = F$$

$$57.2 = F$$

Sunday

$$\frac{9}{5} \cdot 10 + 32 = F$$

$$50 = F$$

RECALL THAT ALL FUNCTIONS START WITH: $y =$ ****

So when you are rewriting an equation so it is in function form that means to isolate: $y =$

Ex: $-2x + 3y = 6$

$$\frac{3y}{3} = \frac{6 + 2x}{3}$$

$$y = 2 + \frac{2}{3}x$$

Ex: $3x + 2y = 8$

$$\frac{2y}{2} = \frac{8 - 3x}{2}$$

$$y = 4 - \frac{3}{2}x$$

Ex: $4x - 2y = -6$

$$\frac{-2y}{-2} = \frac{-6 - 4x}{-2}$$

$$y = 3 + 2x$$

Ex: $-3x - y = 7$

$$\frac{-y}{-1} = \frac{7 + 3x}{-1}$$

$$y = -7 - 3x$$