

DAY 17 NOTES

LITERAL EQUATIONS

Target: Rewrite equations and formulas.

What is a literal equation?!

Solving a literal equation means: Solving an equation for a specific variable

Let's Review! Solve for x: $x - 10 = 5$

$$\begin{array}{r} x - 10 = 5 \\ +10 \quad +10 \\ \hline x = 15 \end{array}$$

You were able to add 5 and 10 because they are like terms!

What if they aren't like terms? Solve for x in the following:

$$\begin{array}{r} x - y = 5 \\ +y \quad +y \\ \hline x = 5 + y \end{array}$$

cannot combine 5 and y because they are not like terms!

For each of the following, solve for y.

A. $2 + y = 8$

$$\begin{array}{r} 2 + y = 8 \\ -2 \quad -2 \\ \hline y = 6 \end{array}$$

B. $6 = 3y - 4$

$$\begin{array}{r} 6 = 3y - 4 \\ +4 \quad +4 \\ \hline 10 = 3y \\ \frac{10}{3} = \frac{3y}{3} \\ y = \frac{10}{3} \end{array}$$

C. $-10 - 2y = 6$

$$\begin{array}{r} -10 - 2y = 6 \\ +10 \quad +10 \\ \hline -2y = 16 \\ \frac{-2y}{-2} = \frac{16}{-2} \\ y = -8 \end{array}$$

Write the equation so that y is a function of x (This means solve for y!) *Get y by itself

D. $2x + y = 8$

$$\begin{array}{r} 2x + y = 8 \\ -2x \quad -2x \\ \hline y = 8 - 2x \end{array}$$

E. $x = 3y - 4$

$$\begin{array}{r} x = 3y - 4 \\ +4 \quad +4 \\ \hline x + 4 = 3y \\ \frac{x+4}{3} = \frac{3y}{3} \\ \frac{x}{3} + \frac{4}{3} = y \end{array}$$

F. $-10x - 2y = 6$

$$\begin{array}{r} -10x - 2y = 6 \\ +10x \quad +10x \\ \hline -2y = 6 + 10x \\ \frac{-2y}{-2} = \frac{6+10x}{-2} \\ y = -3 - 5x \end{array}$$

Write the equation so that x is a function of y (This means solve for x!)

G. $2x + y = 8$
 ~~$-y -y$~~

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

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

H. $2x + y = -4$
 ~~$-y -y$~~

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

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

I. $-10x - 2y = 6$
 ~~$+2y +2y$~~

$$\frac{-10x}{-10} = \frac{6+2y}{-10}$$

$$x = \frac{3}{5} - \frac{1}{5}y$$

Solving Literal Equations as formulas:

1) Solve for R: $P = R + C$

$$\boxed{P + C = R}$$

2) Solve for m: $F = ma$

$$\boxed{\frac{F}{a} = m}$$

3) Solve for t: $d = rt$

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

4) Solve for w: $A = lw$

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

How do Literal Equations relate to the REAL WORLD?!



The Chicago Cubs' newest rookie, Jorge Soler, made history as he began his MLB career with a homerun during his first at-bat (Go Cubs Go!). After 19 at-bats, his batting average today is 0.526. Knowing that you can find a player's batting average (A) by dividing the number of hits (h) by the number of times at bat (b), how many hits has Soler had to-date?

Batting average formula:

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

$$19(.526) = \frac{h}{19} \quad \text{about 10 hits}$$

$$9.994 = h$$

How could you rearrange the batting average formula to solve for the number of times at bat (b)?

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

$$\frac{b \cdot A}{A} = \frac{h}{A} \rightarrow \boxed{b = \frac{h}{A}}$$

b = _____