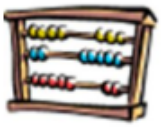
Tear out pages 54 - 57 in workbook.

You will need your Algebra Nation book

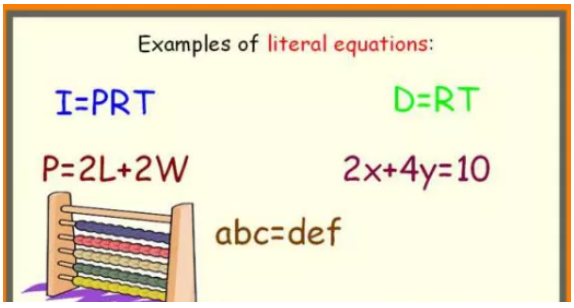
Rearrange formulas to highlight a quantity of interest.

Oct 7-10:50 AM

Definition



- *Literal Equation* – an equation with two or more variables.
  - You can "rewrite" a literal equation to isolate any one of the variables using inverse operations. This is called *solving for a variable*.
  - When you rewrite literal equations, you may have to divide by a variable or variable expression. In this



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A **formula** is an equation that states a relationship among quantities. Formulas are special types of literal equations. Some common formulas are given below. Notice that some of the formulas use the same variables, but the definitions of the variables are different.

Formula Name	Formula	Definitions of Variables
Perimeter of a rectangle	$P = 2\ell + 2w$	P = perimeter, ℓ = length, w = width
Circumference of a circle	$C = 2\pi r$	C = circumference, r = radius
Area of a rectangle	$A = \ell w$	A = area, ℓ = length, w = width
Area of a triangle	$A = \frac{1}{2}bh$	A = area, b = base, h = height
Area of a circle	$A = \pi r^2$	A = area, r = radius
Distance traveled	$d = rt$	d = distance, r = rate, t = time
Temperature	$C = \frac{5}{9}(F - 32)$	C = degrees Celsius, F = degrees Fahrenheit

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2-5 Think About a Plan
Literal Equations and Formulas

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Density The density of an object is calculated using the formula $D = \frac{m}{V}$, where m is the object's mass and V is its volume. Gold has a density of 19.3 g/cm^3. What is the volume of an amount of gold that has a mass of 96.5 g?

KNOW

1. What is the formula you are given for the density of an object?
   $D = \frac{m}{V}$
2. What values are you given in the problem?
   the density of gold is 19.3 $\frac{g}{cm^3}$; the mass of a certain amount of gold is 96.5 g.

NEED

3. What measurement are you asked to determine?
   the volume of the gold
4. Solve $D = \frac{m}{V}$ for the variable V. Show your work.
   $V = \frac{m}{D}$

PLAN

5. Write your new formula. Substitute the values you are given into the formula.
   $V = \frac{96.5}{19.3}$
6. What is the volume of 96.5 g of gold?
   5 cm^3
7. In what units is your answer? Do these units make sense? Explain.
   cm^3; yes; $\frac{g}{\frac{g}{cm^3}} = cm^3$

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2-5 Additional Vocabulary Support

Literal Equations and Formulas

Think	Write
First, copy the problem.	Step 1 $12c + 2d = 48g$
Second, subtract 12c from each side.	Step 2 $12c + 2d - 12c = 48g - 12c$
Next, simplify.	Step 3 $2d = 48g - 12c$
Then, divide each side by 2.	Step 4 $\frac{2d}{2} = \frac{48g - 12c}{2}$
Finally, Divide each term by 2 to simplify.	Step 5 $d = 24g - 6c$

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Section 2 – Topic 8
Rearranging Formulas

STUDY EDGE TIP: When solving for a variable, it's helpful to circle that variable.

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Solve each equation for x.

$2x + 4 = 12$

$2x + y = z$

Did we use different properties when we solved the two equations?

NO

Consider the formula for the perimeter of a rectangle:
$P = 2l + 2w$.

Sometimes, we might need the formula solved for length.

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Let's Practice!

1. Consider the equation $rx - sx + y = z$; solve for x.

$-y \quad -y$

$rx - sx = z - y$

$\frac{x(r-s)}{(r-s)} = \frac{z-y}{r-s}$

$x = \frac{z-y}{r-s}$

Try It!

2. Consider the equation $8c + 6j = 5p$; solve for c.

$-6j \quad -6j$

$\frac{8c}{8} = \frac{5p-6j}{8}$

$c = \frac{5}{8}p - \frac{3}{4}j$ or $c = \frac{5p-6j}{8}$

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3. Consider the equation $\frac{x-c}{2} = d$; solve for c. pg. 48

$2 \cdot \frac{x-c}{2} = 2d$

$x - c = 2d$

$-x \quad -x$

$(-1)(-1c) = (2d - x)(-1)$

$c = -2d + x$

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BEAT THE TEST!

1. Isaiah planted a seedling in his garden and recorded its height every week. The equation shown can be used to estimate the height, h, of the seedling after w weeks since he planted the seedling.

$$h = \frac{3}{4}w + \frac{9}{4}$$

Solve the formula for w, the number of weeks since he planted the seedling.

$w = \frac{4h-9}{3}$ or $w = \frac{4h}{3} - 3$

$4 \cdot h = \left(\frac{3}{4}w + \frac{9}{4}\right) 4$

$4h = \frac{3}{4}w \cdot 4 + \frac{9}{4} \cdot 4$

$4h = 3w + 9$

$-9 \quad -9$

$4h - 9 = 3w$

$\frac{4h-9}{3} = \frac{3w}{3}$

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2. Under the Brannock device method, shoe size and foot length for women are related by the formula $S = 3F - 21$, where S represents the shoe size and F represents the length of the foot in inches. Solve the formula for F.

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$S = 3F - 21$

$+21 \quad +21$

$S + 21 = 3F$

$\frac{S+21}{3} = \frac{3F}{3}$

$F = \frac{S+21}{3}$ or $F = \frac{S}{3} + 7$

Oct 7-11:06 AM

Homework - Complete S2T8

Mangahigh "Literal Equations" due next Sunday 11:59pm

Tomorrow - Inequality Quiz $-\frac{1}{5} < x + \frac{2}{5} < \frac{6}{5}$

-Inform me what summative is your lowest

-I need to pass back your equations quiz

Section 1 Topics 1-4 Quiz Expr and properties (12) (Assigned 8/23 - Due 8/22)	Exponent retake quiz (5P - 5Q) (Assigned 9/4 - Due 9/6)	Section 1 Test (23) (Assigned 9/12 - Due 9/19)	Equations Quiz (8P - 8Q) (Assigned 9/24 - Due 9/28)

Wednesday - Retake of lowest summative - you need to inform me tomorrow what summative is your lowest.

Oct 7-11:06 AM