Literal equations

warm-up

Distribute, Simplify, Combine Like Terms:

1. $3(2x-5)-(x+4)$

$6x-15-x-4$

$5x-19$

2. $-2(x-5)-2(x+3)+12$

$-2x+10-2x-6+12$

$-4x+16$

3. Joey has coupon for 35% off his whole bill at Chili's. Write an expression that represents how much he would pay if the check is x dollars.

$x - .35x$

$.35$

agenda

Warm-Up

HW Check

Notes

Practice

Answers:

1. $x = 10$
2. $n = 2$
3. $d = 12$
4. $x = -3$
5. $x = 7$
6. $y = -17$
7. $-8 = -8$; All real Numbers or $\mathbb{R}$
8. $8 \neq 0$; No solutions or $\varnothing$
9. $a = 42$
10. $n = 66$

[redacted]

12. $x = 5$; 28m of fencing
13. $h = 16$; 16 hours
14. $x = 52.5$; 52.5° and 127.5°
15. $x = 25$; 65°

Algebra I - Unit 1: Topic 2 – Solving Multi-Step Equations with Variables on Both Sides

Practice - Solving Multi-Step Equations with Variables on Both Sides pp 100-106

Name _____ Date _____ Per _____

Solve the following problems, and then check your answer.

1. $6x + 7 = 8x - 13$

2. $2(5n - 2) = 4(n + 2)$

3. $3d - 18 = -d + 30$

4. $x + 4 = \frac{-3x - 7}{2}$

5. $-x + 3 = -\frac{4}{7}x$

6. $28 - 2.2y = 11.6y + 262.6$

7. $-8 - 3x = x - 4(2 + x)$

8. $6(y + 2) - 4 = 6y$

9. $4(2a - 8) = \frac{1}{7}(49a + 70)$

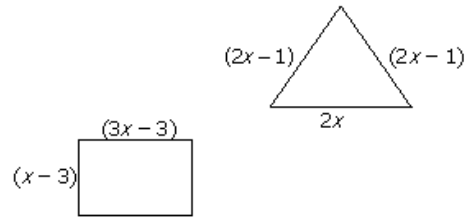
Algebra I - Unit 1: Topic 2 – Solving Multi-Step Equations with Variables on Both Sides

Define a variable, set up an equation, then solve. Write your answer in a complete sentence.

10. Two less than 2 times a number is 64 plus the same number. Find the number.

11. Twice the greater of two consecutive odd integers is 13 less than three times the lesser. Find the integers.

12. Claire purchased just enough fencing (in meters) to border either a rectangular or triangular garden shown below whose perimeters are the same. What is the value of x and how much fencing did she buy?



13. A moving company charges $800 plus $16 per hour. Another moving company charges $720 plus $21 per hour. How long is a job that costs the same no matter which company they use?

14. The measure of an angle is 75° more than its supplement. Find the measure of each angle.

180°

75+x+x=180

75+2x=180

−75 −75

2x=105

2 2

x=52.5°

127.5°

15. The complement of an angle is 15° more than twice the measure of the angle. Find the measure of the largest angle.

90°

x+15+2x=90

x

15+2x

p. 14

Algebra I - Unit 1: Topic 2 – Literal Equations

Student Notes – Literal Equations pp 107-108

What is a formula? an equation that states a rule for a relationship among quantities

- Speed is the quotient of distance and time.

Speed = $\frac{\text{distance}}{\text{time}}$ $s = \frac{d}{t}$

If you ran 24 miles in 3 hours, what was your speed? $24/3 = 8$ mph

What is a literal equation? an equation with two or more variables

1. What if you needed to solve for another variable in this equation? Could you calculate your distance if you ran for 4.5 hours at a speed of 6.4 miles per hour?

Solving for variables in literal equations:


Identify the variable (highlight)


Name the operations on the variable


Use inverse operation to isolate variable

Let's try it!

- $s = \frac{d}{t}$
- d is divided by t.
- multiply by t.

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

$ts = d$

CAN NOT ADD #'S & letters.

2. In the United States, shoe sizes and foot length are related by the formula $s = 3f - 24$ where s represents the shoe size and f represents the foot length in inches.

A. Solve this formula for f, foot length in terms of s, shoe size.

$s = 3f - 24$

$+24 \quad +24$

$s + 24 = 3f$

$\frac{s+24}{3} = \frac{3f}{3}$

$\frac{s+24}{3} = f$

B. According to this formula, if your wear a size 15 shoe, how long is your foot?

$s = 15$

$\frac{15+24}{3} = \frac{39}{3} = 13$ in

your shoe size $\frac{+24}{3}$

3. Answer the questions below:

A. The area of a triangle can be found by using the formula:

$A = \frac{bh}{2}$

B. If you were given the area and height, solve the formula for the base of the triangle.

$2 \cdot A = \frac{bh}{2} \cdot 2$

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

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

C. For a triangle with an area of $96 cm^2$ and a height of $8 cm$, calculate the base of the triangle.

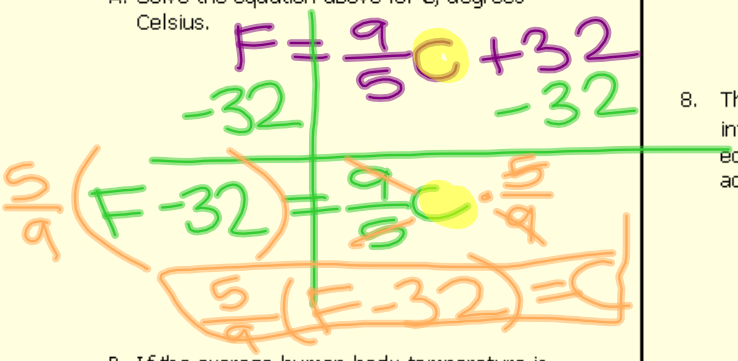
$b = \frac{2(96)}{8}$

24cm

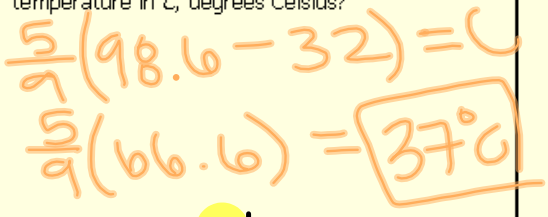
Algebra I - Unit 1: Topic 2 – Literal Equations

4. The United States uses the Fahrenheit system for temperature whereas the United Kingdom uses the Celsius system. The formula $F = \frac{9}{5}C + 32$ can be used to convert from temperatures in Celsius, C to Fahrenheit, F.

   A. Solve the equation above for C, degrees Celsius.



   B. If the average human body temperature is 98.6°F, what is the equivalent body temperature in C, degrees Celsius?



5. Solve the equation $9 + 3x = 2y$ for x.

6. Solve the equation $2a - 0.3b = 10$ for a.

7. Solve the equation $3(y + 12) = 2x$ for y.

8. The equation $I = Prt$, can be used to calculate the interest earned on a savings account. Solve the equation for P, the principle or value of the savings account.

9. The kinetic energy, KE, of an object is the energy it possesses because of its motion. The formula for kinetic energy is $KE = \frac{1}{2}mv^2$, where m is the mass of the object and v is the velocity of the object. Solve this equation for the mass of any object.

Algebra I - Unit 1: Topic 2 – Literal Equations

Practice - Literal Equations pp 107-108

Name _____ Date _____ Per _____

1. The formula $F = m \bullet a$ can be used to find the force, F, of an object when given it's mass, m, and it's acceleration, a. Solve this formula for an object's mass.

2. The formula for the circumference of a circle is $C = 2\pi r$. Solve the formula for r.

3. For altitudes up to 36,000 feet, the relationship between temperature and altitude can be described by the formula $t = -0.0035a + g$. Solve this formula for a.

4. The formula $c = 5p + 215$ relates c, the total cost in dollars of hosting a birthday party at Pizza Palace, to p, the number of people attending.

   A. Solve the formula for p.

   B. If Allie's parents are willing to spend $300 for a party, how many people can attend?

Solve the following:

5. $ax + r = 7$ for r

6. $5p + 9c = p$ for c

7. $a - \frac{1}{3}b = c$ for a

8. $s = \frac{1}{2}gt^2$ for g

9. Which of the following is a correct method for solving $2a - 5b = 10$ for b?

   A Add $5b$ to both sides, then divide both sides by 2
   B Subtract $5b$ from both sides, then divide both sides by 2
   C Divide both sides by 5, then add $2a$ to both sides
   D Subtract $2a$ from both sides, then divide both sides by -5.

10. The density of an object can be calculated using the formula $d = \frac{m}{V}$, where m is the mass of the object and V is the volume of the object.

    A. Solve the formula for V.

    B. If an object has a mass of 30 grams and a density of $2.5 \frac{g}{cm^3}$, what is the volume of this object?