Monday, August 13, 2018

Simplify each expression.

1. $\sqrt{150} - 7\sqrt{24}$ → $-9\sqrt{6}$

2. $-2\sqrt{90} - 5\sqrt{40}$ → $-16\sqrt{10}$

3. $3\sqrt{98} - 6\sqrt{18}$ → $3\sqrt{2}$

4. $\sqrt{2a} - 15\sqrt{7} - 5\sqrt{2a} + 3\sqrt{7}$ → $-4\sqrt{2a} - 12\sqrt{7}$ "like radicals"

5. $-9\sqrt{x} + 4\sqrt{y} - 4\sqrt{x} + 2\sqrt{y}$ → $-13\sqrt{x} + 6\sqrt{y}$

multiplying $-9\sqrt{x} \cdot 4\sqrt{y}$ multiplying coefficient, then radicand, simplify

$-36\sqrt{xy}$

Jul 31-4:26 PM

Foundations of Algebra Unit 1 – Rational and Irrational Numbers Notes

Name: _____ Date: _____

Day 8 – Pythagorean Theorem

Today, we will be learning one of the most common formulas used in math, the Pythagorean Theorem. The Pythagorean Theorem is a relation in geometry that works for RIGHT TRIANGLES ONLY.

Pythagorean Theorem

$a^2 + b^2 = c^2$

or

$leg^2 + leg^2 = hyp^2$

*Where 'c' is always the hypotenuse.

The **hypotenuse** is the longest side/leg in a right triangle.

Use the Pythagorean Theorem to find the length of each hypotenuse:

1. $a^2 + b^2 = c^2$, $3^2 + 4^2 = c^2$, $9 + 16 = c^2$, $25 = c^2$, $5 = c$

2. $a^2 + b^2 = c^2$, $4^2 + 9^2 = c^2$, $16 + 81 = c^2$, $97 = c^2$, $9.84 = c$

Find the length of the third side given two sides.

3. a = 16, b = 12: $16^2 + 12^2 = c^2$, $256 + 144 = c^2$, $400 = c^2$, $20 = c$

4. a = 3, c = 4: $3^2 + b^2 = 4^2$, $9 + b^2 = 16$, $-9 \quad -9$, $b^2 = 7$, $b = 2.64$

5. a = √204, b = 14: $a^2 + b^2 = c^2$, $\sqrt{204}^2 + 14^2 = c^2$, $204 + 196 = c^2$, $400 = c^2$, $20 = c$

6. a = 6, c = 10: $a^2 + b^2 = c^2$, $6^2 + b^2 = 10^2$, $36 + b^2 = 100$, $-36 \quad -36$, $\sqrt{b^2} = \sqrt{64}$, $b = 8$

T-2 are opposite, they cancel

Aug 8-1:05 PM

Foundations of Algebra Unit 1 – Rational and Irrational Numbers Notes

Use the Pythagorean Theorem to find the missing side:

7. leg = 8, leg = 15, hyp = ____: $8^2 + 15^2 = c^2$, $64 + 225 = \sqrt{289}\sqrt{c^2}$, $17 = c$

8. leg = 3, leg = ____, hyp = 12: $a^2 + b^2 = c^2$, $3^2 + b^2 = 12^2$, $9 + b^2 = 144$, $-9 \quad -9$, $\sqrt{b^2} = \sqrt{135}$, $b = 11.6$

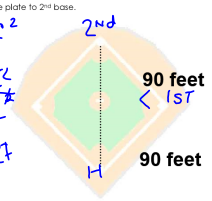
Determine whether the given lengths are sides of a right triangle.

9. 12, 20, 16 (hypotenuse (longest), legs): $a^2 + b^2 = c^2$, $12^2 + 16^2 = 20^2$, $144 + 256 = 400$, $400 = 400$ ✓ Yes! Right Δ

10. 25, 24, 10 (hypotenuse): $10^2 + 24^2 = 25^2$, $100 + 576 = 625$, $676 \neq 625$ NO

11. Find the distance from home plate to 2nd base.

$90^2 + 90^2 = c^2$, $16200 = c^2$, $\sqrt{16200} = \sqrt{c^2}$, $c = 127.27$



Aug 8-1:05 PM

Foundations of Algebra Unit 1 – Rational and Irrational Numbers Practice

Name _____ Date: _____

Day 8 – Pythagorean Theorem

Use the Pythagorean Theorem to find the third side of each triangle if "a" and "b" are legs and "c" is the hypotenuse of the right triangle.

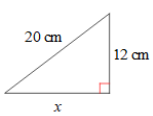
1. a = 3, b = 4
2. c = 10, a = 6
3. b = 24, c = 26
4. a = 7, b = 24
5. c = 34, b = 30
6. a = 9, b = 40
7. b = 21, c = 29
8. a = 12, b = 35
9. b = 60, c = 61
10. a = 8, b = 15
11. a = 5, b = 6
12. a = 8, c = 12
13. a = 6, b = 7
14. b = 12, c = 15
15. a = 5, c = 10

Aug 8-1:07 PM

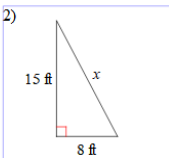
Tuesday, August 14, 2018

Find the missing side of each triangle.

1)



2)



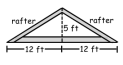
Jul 31-4:26 PM

Foundations of Algebra Unit 1 – Rational and Irrational Numbers Practice

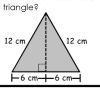
16. How high is the TV screen?

17. How far above the ground is the kite?

18. How long is each rafter?



19. What is the altitude of the equilateral triangle?



20. The anchor of a boat is 60 ft. right below its stem. The distance from the anchor to the bow of the boat is 61 feet. What is the length of the deck from bow to stern?

21. One end of a rope is attached to the top of a sailboat mast. It is drawn tightly and attached 9 feet from the base of the mast. The rope is 41 feet long. How high is the mast?

22. The diagonal brace on a gate is 2 meters long. The height of the gate is 1 meter. How wide is the gate?

23. Lucas walked 62 yards due north, then 30 yards due east. How far is Lucas from his starting point?

Aug 8-1:09 PM

Wednesday, August 15, 2018

1. The bottom of a ladder must be placed 3 feet from a wall. The ladder is 10 feet long. How far above the ground does the ladder touch the wall?

2. A soccer field is a rectangle 100 meters wide and 130 meters long. The coach asks players to run from one corner to the other corner diagonally across. What is that distance?

Jul 31-4:26 PM

Foundations of Algebra Unit 1 – Rational and Irrational Numbers Study Guide

Name _____ Date _____

UNIT 1 TEST REVIEW

Use the following to review for you test. Work the Practice Problems on a separate sheet of paper.

What you need to know and do	Things to remember	Practice Problems	
1. Classifying Numbers	Natural: 1, 2, 3... Whole: 0, 1, 2... Integer: -1, 0, 1... Rational: Can be written as a fraction Irrational: Unsimplified Radical or Non repeating decimal	Classify each as rational or irrational. 1. -41 2. 36/9 3. $\sqrt{45}$	Name all of the sets of numbers to which each belongs. (Natural, Whole, Integer, Rational, Irrational, Real) 4. 6.919191... 5. -28/7 6. 0
2. Operations with Rational Numbers and Applications	Identify the operation (addition, subtraction, multiplication, division)	7. In a school survey, 7/9 of the 2400 students preferred hip-hop music. How many students like hip-hop music?	8. The inseam on Juan's pants is 34 ¼ inches. If he has them shortened by 2 7/8 inches, what is the new length?
3. Comparing Rational Numbers	Convert to decimals and then compare.	Compare the following: 9. 3.2 ____ $\sqrt{9.5}$ 10. $1\frac{1}{2}$ ____ $\sqrt{3}$	Order each set of numbers from least to greatest. 11. $4\frac{1}{3}$, $\sqrt{43}$, $\frac{12}{3}$, 4.13
4. Rounding	Circle the number. Look next door. 5 or above, add 1 more. 4 or below, just ignore.	Round to the hundredths. 12. $\sqrt{45}$ 13. $\frac{17}{18}$	Round to the thousandths. 14. $-\frac{3}{16}$ 15. $\sqrt{7}$

Aug 8-1:10 PM

Foundations of Algebra Unit 1 – Rational and Irrational Numbers Study Guide

5. Estimating Radicals	Identify the two perfect squares that the radicand falls between.	16. The $\sqrt{14}$ lies between which two integers?	17. Identify the two integers that the square root is between, then determine which one it is closest to. $\sqrt{51}$
6. Simplify a Radical	Prime Factor the radicand and look for Pairs.	18. $\sqrt{24x^4y^5}$	19. $-3x\sqrt{48x^3y^4}$
7. Add / Subtract Radicals	You can only add or subtract if the radicand is the same. Try to simplify first. Simplify again at the end.	20. $\sqrt{7x^2} - 3\sqrt{7x^2}$	21. $3\sqrt{18} - \sqrt{32} + 5\sqrt{2}$
8. Multiply Radicals	Multiply Outside by Outside and Inside by Inside. Simplify at the end.	22. $-3\sqrt{5} \cdot 2\sqrt{30}$	23. $\left(4\sqrt{3x^3}\right)\left(\sqrt{6xy}\right)$
9. Pythagorean Theorem	$a^2 + b^2 = c^2$	24. Find the missing length. a. a = 5, b = 12 b. a = 11, c = 20	25. A field hockey field is a rectangle 60 yards by 100 yards. What is the length of the diagonal from one corner of the field to the opposite corner?

Aug 8-1:10 PM

Thursday, August 16, 2018

Solve the word problems that you copied down yesterday.

Jul 31-4:26 PM

Friday, August 17, 2018

Draw a picture to help you answer the following. You do not have to write the question.

A baseball diamond is a square that is 90 feet on each side. What is the distance a catcher has to throw the ball from home to second base?

David leaves the house to go to school. He walks 200m west and 125m north. How far away is he from his starting point? (the diagonal)

Jul 31-4:26 PM

Foundations of Algebra Unit 2 – Relationships Among Quantities Notes

Name: _____ Date: _____

Day 1 – Interpreting Language in Mathematic Expressions

An _____ _____ is a mathematical sentence. An equation shows that two things are _____. An example of an algebraic equation is: 2x + 10y + 6 = 30.

An expression containing variables (letters), numbers, and operation symbols is called an _____ _____. An example of an algebraic expression is: 5x + 7y – 3.

Algebraic Expression

$\underbrace{x - 2 = 5}$

Algebraic Equation

In an algebraic expression, there are four different parts: coefficients, variables, constants, and terms.

5x + 7y – 3

Variables are the letters in an expression.

5**x** + 7**y** – 3

Coefficients are the numbers in front of the variables.

5x + **7**y – 3

Constants are the "plain numbers" or terms without variables

5x + 7y **– 3**

Terms are separated by a + or – sign and can be numbers and/or variables

5x + **7y** – **3**

Complete the table below.

Expression	How Many Terms?	List Variables	List Constants	List Coefficients
2x + 5z – 3				
13				
$6m^2 - 9m^2 + s - 4$				
$x^2 + 7x - 1$				

Aug 8-1:13 PM

Foundations of Algebra Unit 2 – Relationships Among Quantities Notes

Additional Mathematics Vocabulary

An **Exponent** is representative of the number of times you _____ something times itself.
Example: 2^4

The **Base** is a number or variable that has been raised to a _____.

Example: $\mathbf{2}^4$

Like Terms are terms that have the same _____ raised to the same _____.

Examples: -3p and 6p
$5x^2$ and $93x^2$
1 and 4 (these are both constants)

Factors are _____ and/or _____ that are being multiplied together to get a product.

Example: Factors of 6 are: 1 and 6 or 2 and 3
Factors of 9xy are: _____, _____, _____, and _____
Factors of $(x + 2)(y - 3)$ are: $(x + 2)$ and $(y - 3)$
Factors of $3(z - 9)$ are: _____ and _____

The **Order of Operations** is a set of rules that we follow when making calculations. It instructs us to:

1. Simplify inside parenthesis
2. Take care of exponents
3. In order from left to right, multiplication or division
4. In order from left to right, addition or subtraction

Some may have learned this as **PEMDAS** or "**P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally":

P – Parenthesis
E – Exponents
MD – Multiplication or Division
AS – Addition or Subtraction

Example: Solve the following using the Order of Operations.

$$5 - 3(2 + 1)^2 + 4$$

Aug 8-1:15 PM

Foundations of Algebra Unit 2 – Relationships Among Quantities Notes

Writing Expressions in Words

Addition	Subtraction	Multiplication	Division
Sum	Difference	Of	Quotient
Increased by	Decreased by	Product	Ratio of
More than	Minus	Times	Percent
Combined	Less	Multiplied by	Fraction of
Together	Less than	Double	Out of
Total of	Fewer than	Twice	Per
Added to		Triple	Divided by
Gained	**Use Parenthesis:** The quantity of		
Raised			
Plus			

Practice: Write the expression for each verbal description:

1. The difference of 10 and 5
2. The quotient of 14 and 7
3. y decreased by 17
4. x increased by 6
5. The sum of q and 8
6. 6 squared
7. Twice q
8. 4 times 5 plus 7
9. 8 more than twice k
10. 2 minus the quantity 3 more than p
11. Half of the quantity 1 less than w

Practice: Write each as a verbal expression.

1. $\frac{x}{2}$
2. a + 9
3. 5n – 7
4. 3(y + 7)

Aug 8-1:15 PM

Foundations of Algebra Unit 2 – Relationships Among Quantities Practice

Name _____ Date _____

Day 1 – Interpreting Language in Mathematic Expressions

1. Identify each term, coefficient, and constant in $5x^2 + 3x + 12$.

2. Write an expression with 4 terms, containing the coefficients 3, 6, and 9.

Translate each verbal expression to an algebraic expression.

3. Eight more than 3 times a number
4. The difference of 10 and a number
5. The quotient of 12 and a number
6. 15 less than twice a number
7. Three-fourths the square of a number
8. The product of 5 and the cube of a number increased by the difference of 6 and x
9. Half the sum of x and y decreased by one-third of y
10. The sum of a number and six, divided by eight

Translate each algebraic expression to a verbal expression.

11. $25 - x$
12. $x^4 - 12$
13. $3 + \frac{1}{2}x$
14. $8^2 - x$
15. $\frac{6 - x}{13}$
16. $25(6 + x)$

Aug 8-1:16 PM