January 7, 2019 Monday

1. Sally is on the All-City track team and has to run the 100-meter dash. How many decameters will she run?
100 m
10 dkm
2. Each year, the New York City Marathon which is 42 km, is run by thousands of people. If you and two friends go run the marathon, how many meters will all three of you run?
42
42000 m
42000 m
x 3
126000 m
3. A recipe for shortbread cookies calls for 5 grams of butter to make 12 cookies. How many decigrams will there be in 60 cookies?
5
50 dg
x 5
250 dg
60/12 = 5

Jan 3-3:03 PM

Alg 1 – Day 3 NOTES Dimensional Analysis Name

Setup and solve the following using dimensional analysis.

1. 5,400 inches to miles
$5400\text{in}\left(\frac{1\text{ft}}{12\text{in}}\right)\left(\frac{1\text{mi}}{5280\text{ft}}\right)=0.085\text{mi}$
2. 16 weeks to hours
$16\text{wk}\left(\frac{7\text{days}}{1\text{wk}}\right)\left(\frac{24\text{hr}}{1\text{day}}\right)=2688\text{hr}$
3. 54 yards to cm
$54\text{yd}\left(\frac{3\text{ft}}{1\text{yd}}\right)\left(\frac{12\text{in}}{1\text{ft}}\right)\left(\frac{2.54\text{cm}}{1\text{in}}\right)=$
4937.76 cm
4. 36 cm/sec to feet/min
5. 1.09 g/mL to lbs/qt
6. 32 ft/sec to meters/sec

1 mile = 5,280 ft
1 inch = 2.54 cm
3 feet = 1 yard
454 g = 1lb
946 mL = 1 qt
4 qt = 1 gal

$\frac{5\text{mi}}{5280\text{ft}}$ OR $\frac{5280\text{ft}}{1\text{mi}}$

Conversions Factors

1 hr = 60 min	1 min = 60 sec	1 ton = 2000 lbs	7 days = 1 week
24 hrs = 1 day	1 kg = 2.2 lbs	1 gal = 3.79 L	264.2 gal = 1 cubic meter
1 mi = 5,280 ft	1 kg = 1000 g	1 lb = 16 oz	20 drops = 1 mL
365 days = 1 yr	52 weeks = 1 yr	2.54 cm = 1 in	1 L = 1000 mL
0.621 mi = 1.00 km	1 yd = 36 inches	1 cc is 1 cm³	1 mL = 1 cm³

Solve each problem using dimensional analysis. Every number must have a unit. Work must be shown. Conversion factors are given above.

7. How many miles will a person run during a 25 kilometer race?
$25\text{km}\left(\frac{.621\text{mi}}{1\text{km}}\right)=15.5\text{mi}$
8. The moon is 250,000 miles away. How many feet is it from earth?
$250{,}000\left(\frac{5280\text{ft}}{1\text{mi}}\right)=1{,}320{,}000{,}000\text{ft}$
9. A notebook computer has a mass of 3.85 kilograms. About how many pounds does the notebook weigh?
$3.85\text{kg}\left(\frac{2.2\text{lb}}{1\text{kg}}\right)=8.47\text{lb}$
10. Seventy-five miles per hour is how many feet per minute?

Answers: 66000, 647000, 8.47, 1320,000,000

Jan 7-11:34 AM

10. Seventy-five miles per hour is how many feet per minute?

Jan 7-11:34 AM

$75\frac{\text{mi}}{\text{hr}}\left(\frac{5280\text{ft}}{1\text{mi}}\right)\left(\frac{1\text{hr}}{60\text{min}}\right)=6600\frac{\text{ft}}{\text{min}}$

4. 36 cm/sec to feet/min
$36\frac{\text{cm}}{\text{sec}}\left(\frac{1\text{in}}{2.54\text{cm}}\right)\left(\frac{1\text{ft}}{12\text{in}}\right)\left(\frac{60\text{sec}}{1\text{min}}\right)=70.9\frac{\text{ft}}{\text{min}}$
5. 1.09 g/mL to lbs/qt
$1.09\frac{\text{g}}{\text{mL}}\left(\frac{1\text{lb}}{454\text{g}}\right)\left(\frac{946\text{mL}}{1\text{qt}}\right)=2.27\frac{\text{lb}}{\text{qt}}$
6. 32 ft/sec to meters/sec
$32\frac{\text{ft}}{\text{sec}}\left(\frac{12\text{in}}{1\text{ft}}\right)\left(\frac{2.54\text{cm}}{1\text{in}}\right)\left(\frac{1\text{m}}{100\text{cm}}\right)=9.75\frac{\text{m}}{\text{sec}}$

1 mile = 5,280 ft
1 inch = 2.54 cm
3 feet = 1 yard
454 g = 1lb
946 mL = 1 qt
4 qt = 1 gal

$\frac{5\text{mi}}{5280\text{ft}}$ OR $\frac{5280\text{ft}}{1\text{mi}}$

Jan 7-10:59 AM

U1 ~ Day 3 Dimensional Analysis WS

BS 1) How many minutes are in 3 years? 1576800 min
SH 2) How many feet are in 2 miles? 10560 ft
SB 3) How many inches are in 1 mile? 63360 in
MB 4) How many cups are in 4 gallons? 64 cups
5) How many ounces are in 2 gallons?
6) A person weighs 156 pounds, convert their weight to kilograms.
7) How many centimeters are in 3.5 kilometers?
8) How many centimeters are in 4 yards? (given 2.54 centimeters = 1 inch)

LS 9) How many seconds in 2 weeks? 1209600 s
YK 10) How many minutes in the month of October? 31days 44640 min
11) How many seconds in the months whose name ends in 'y' (with February having 28 days)?
12) How many hours in a school year? (given a 1 school year = 180 days & 1 day of school = 8 hours)
13) How many seconds do you spend in 2nd period in one week?
14) If you travel 53 yards per hour, how many inches per day do you travel?
15) If a turtle travels 88 inches per second, how many miles per day does the turtle travel?

Jan 3-3:10 PM

U1 ~ Day 3 Dimensional Analysis Homework
Name _____

Conversions Factors		
1 kg = 2.2 lbs	1 gal = 3.79 L	264.2 gal = 1 cubic meter
1 mi = 5,280 ft	1 kg = 1000 g	1 lb = 16 oz
1 L = 1000 mL	1 mL = 1 cm³	2.54 cm = 1 in
0.621 mi = 1.00 km	1 yd = 36 inches	1 cc is 1 cm³

Solve each problem using dimensional analysis. Be sure that every number has a unit and units should be consistent before you try to find the area or volume.

1. A contractor wants to order concrete for a wall that is 24 feet long, 10 feet high, and 9 inches thick. How many cubic yards should he order? V= lwh

2. A game preserve has determined that deer need 50 square meters of space in order to have enough food to survive. If the size of the preserve is 42 hm long and 560 dekameters wide, how many deer can it support? A = lw

3. If one guppy requires 5 liters of water to live happily, what is the maximum number of guppies that should be kept in this aquarium? V=lwh

Solve each problem using dimensional analysis. Every number must have a unit. Work must be shown.

1. How many miles will a person run during a 10 kilometer race?

2. The moon is 250,000 miles away. How many feet is it from earth?

Jan 3-3:11 PM

U1 ~ Day 3 Dimensional Analysis Homework

3. A notebook computer has a mass of 2.25 kilograms. About how many pounds does the notebook weigh?

4. A family pool holds 10,000 gallons of water. How many cubic meters is this?

5. Sixty miles per hour is how many feet per minute?

6. Trent purchases 44 euros worth of souvenirs while on vacation in France. If $1 U.S. = 0.678 euros, find the cost of the souvenirs in U.S. dollars. Round to the nearest cent.

7. A small herd of cattle consumes fourteen bales of hay in two weeks. How many bales will this herd consume in a year?

Jan 3-3:11 PM

U1 ~ Day 2 Unit Conversions & Dimensional Analysis HW
Name _____

Setup and solve the following using dimensional analysis.

Conversions

1 hour = 3600 seconds	1 mile = 5280 feet	1 yard = 3 feet
1 meter = 3.28 feet	1 km = 0.62 miles	1 light second = 300,000,000 meters
1 kg = 2.2 lbs	1 lb = 0.45 kg	1 quart = 0.946 liters
1 m/s = 2.2 miles/hour	1 foot = 12 inches	1 inch = 2.54 cm = 25.4 mm

1. 43 miles into feet
2. 165 pounds into kilograms
3. 5,400 inches to miles
4. 16 weeks to hours
5. 54 yards to cm
6. 19 inches to feet
7. 840 in. to cm.
8. 36 cm/sec to feet/min
9. 1.09 g/mL to lbs/qt
10. 32 ft/sec to meters/sec

Jan 3-3:12 PM

U1 ~ Day 2 Unit Conversions & Dimensional Analysis HW

11. You have the Heebie-Geebies. Your grandmother sends you a remedy for the Heebie-Geebies with the following instructions: "Take 1 drop per 10 lbs. of body weight per day divided into 4 doses until the Heebie-Geebies are gone." How many drops do you take per dose??

12. You're throwing a pizza party for 15 people and figure that each person will eat 4 slices. You call up the pizza place and learn that each pizza will cost you $14.78 and it will be cut into 12 slices. How much is the pizza going to cost you? You only have $70. Will you have enough money?

13. Every three times I clean my bedroom, my mother makes me an apple pie. I cleaned my bedroom 9 times. How many apple pies does she owe me? (What?! Your mother doesn't reward you for cleaning your bedroom? Aren't there child labor laws? To make up for that injustice, you may have this very easy problem.)

14. In my chemistry class, 28 students are each given 3 pens. If there are 8 pens in one package, priced at $1.88 per package, what is the total cost of giving away pens?

Jan 3-3:12 PM

January 8, 2019, Tuesday

1) How many ounces are in 2 gallons? 128 fl. oz. = 1 gal.

$2 \text{ gal} \times \frac{128 \text{ oz}}{1 \text{ gal}} = 256 \text{ oz}$ $\left(\frac{128 \text{ oz}}{1 \text{ gal}}\right)$ OR $\left(\frac{1 \text{ gal}}{128 \text{ oz}}\right)$

2) A person weighs 156 pounds, convert their weight to kilograms.

$156 \text{ lb} \times \left(\frac{1 \text{ kg}}{2.2 \text{ lb}}\right) = 70.2 \text{ kg} = 70 \text{ kg}$

3) How many centimeters are in 3.5 kilometers?

3.5 km

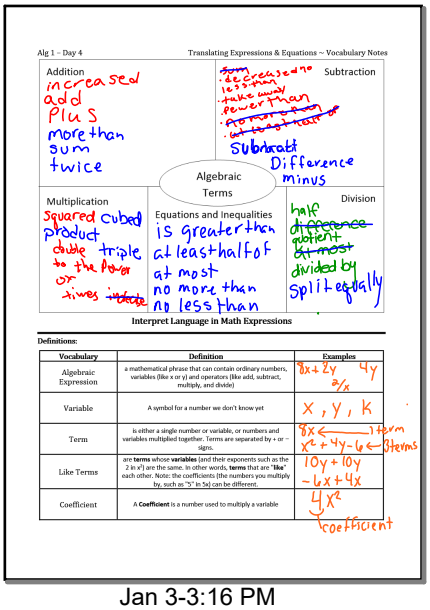
350000 cm

Jan 3-3:15 PM

Words for the organizer:

squared, at least half of, difference, split equally, quotient, minus, sum, double, at most, cubed, divided by, increased, more than, fewer than, product, times, no more than, half, subtract, add, raised to the power of, plus, takeaway, is greater than,triple, twice,decreased no less than

Jan 8-9:56 AM


Alg 1 – Day 4 Translating Expressions & Equations ~ Vocabulary Notes

Addition: increased, add, plus, more than, sum, twice

Subtraction: decreased, less than, take away, fewer than, no more than, no less than, subtract, Difference, minus

Algebraic Terms

Multiplication: squared, cubed, product, double, triple, to the ____ or ____ times, twice

Equations and Inequalities: is, greater than, at least, half of, at most, no more than, no less than

Division: half, difference, quotient, at most, divided by, Split equally

Interpret Language in Math Expressions

Definitions:

Vocabulary	Definition	Examples
Algebraic Expression	a mathematical phrase that can contain ordinary numbers, variables (like x or y) and operators (like add, subtract, multiply, and divide)	$8x+2y$, $4y$, a/x
Variable	A symbol for a number we don't know yet	x, y, k
Term	is either a single number or variable, or numbers and variables multiplied together. Terms are separated by + or − signs.	$8x$ ← 1 term; x^2+4y-6 ← 3 terms
Like Terms	are **terms** whose **variables** (and their exponents such as the 2 in x^2) are the same. In other words, **terms** that are "**like**" each other. Note: the coefficients (the numbers you multiply by, such as "5" in 5a) can be different.	$10y+10y$, $-6x+4x$
Coefficient	A **Coefficient** is a number used to multiply a variable	$4x^2$, coefficient

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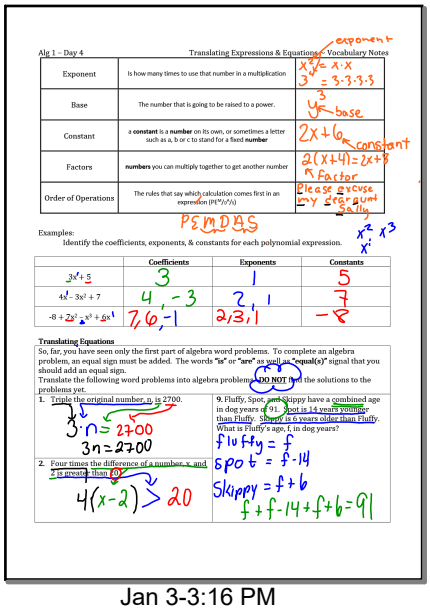

Alg 1 – Day 4 Translating Expressions & Equations ~ Vocabulary Notes

Exponent	is how many times to use that number in a multiplication	$x^3 = x \cdot x$, $3^4 = 3 \cdot 3 \cdot 3 \cdot 3$; exponent, base
Base	The number that is going to be raised to a power.	
Constant	a **constant** is a **number** on its own, or sometimes a letter such as a, b or c to stand for a fixed **number**	$2x+6$, constant
Factors	**numbers** you can multiply together to get another number	$2(x+4)=2x+8$, factor
Order of Operations	The rules that say which calculation comes first in an expression (PE*D/A^S)	Please excuse my dear aunt Sally; PEMDAS

Examples:
Identify the coefficients, exponents, & constants for each polynomial expression.

	Coefficients	Exponents	Constants
$3x^4+5$	3	1	5
$4x^2-3x^3+7$	4, −3	2, 3	7
$-8+2x^7-x^3+6x^1$	7, 6, −1	2, 3, 1	−8

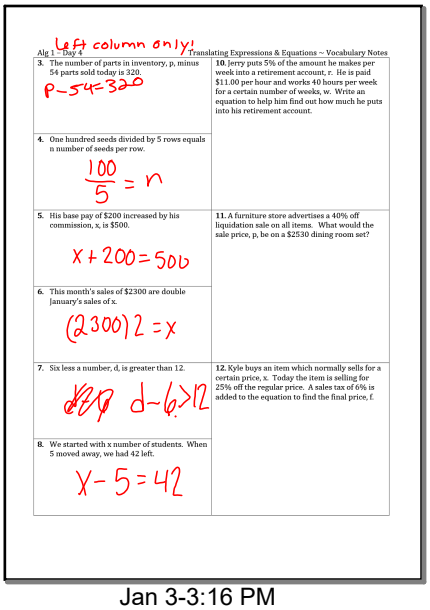
x^2 x^3 x^1

Translating Equations

So, far, you have seen only the first part of algebra word problems. To complete an algebra problem, an equal sign must be added. The words **"is"** or **"are"** as well as **"equal(s)"** signal that you should add an equal sign.
Translate the following word problems into algebra problems. **DO NOT** find the solutions to the problems yet.

1. Triple the original number, n, is 2700. $3 \cdot n = 2700$, $3n = 2700$
2. Four times the difference of a number, x, and 2 is greater than 20. $4(x-2) > 20$
9. Fluffy, Spot, and Skippy have a combined age in dog years of 91. Spot is 14 years younger than Fluffy. Skippy is 6 years older than Fluffy. What is Fluffy's age, f, in dog years? fluffy = f, spot = f−14, Skippy = f+6, $f+f-14+f+6=91$

Jan 3-3:16 PM


Left column only!

Alg 1 – Day 4 Translating Expressions & Equations ~ Vocabulary Notes

3. The number of parts in inventory, p, minus 54 parts sold today is 320. $p-54=320$

4. One hundred seeds divided by 5 rows equals n number of seeds per row. $\frac{100}{5}=n$

5. His base pay of $200 increased by his commission, x, is $500. $x+200=500$

6. This month's sales of $2300 are double January's sales of x. $(2300)2=x$

7. Six less a number, d, is greater than 12. $d-6>12$

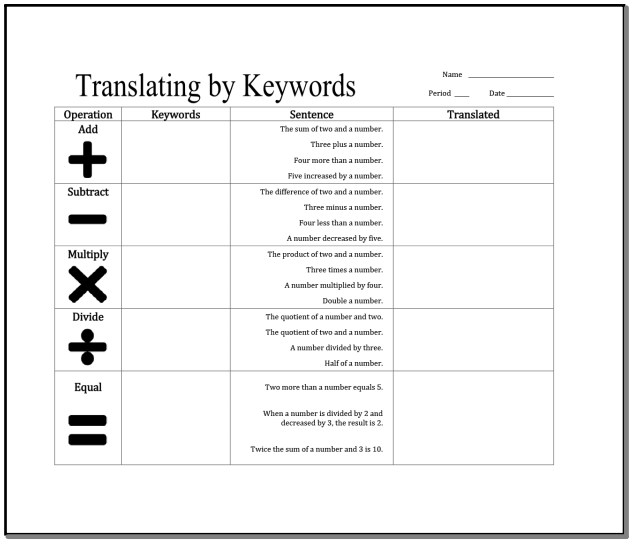
8. We started with x number of students. When 5 moved away, we had 42 left. $x-5=42$

10. Jerry puts 5% of the amount he makes per week into a retirement account, r. He is paid $11.00 per hour and works 40 hours per week for a certain number of weeks, w. Write an equation to help him find out how much he puts into his retirement account.

11. A furniture store advertises a 40% off liquidation sale on all items. What would the sale price, p, be on a $2530 dining room set?

12. Kyle buys an item which normally sells for a certain price, x. Today the item is selling for 25% off the regular price. A sales tax of 6% is added to the equation to find the final price, f.

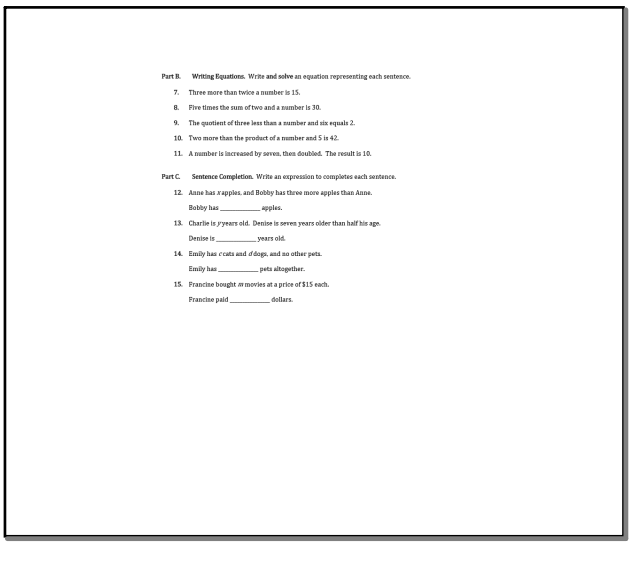
Jan 3-3:16 PM


Translating by Keywords

Name _____ Period ____ Date _____

Operation	Keywords	Sentence	Translated
Add +		The sum of two and a number. Three plus a number. Four more than a number. Five increased by a number.	
Subtract −		The difference of two and a number. Three minus a number. Four less than a number. A number decreased by five.	
Multiply ×		The product of two and a number. Three times a number. A number multiplied by four. Double a number.	
Divide ÷		The quotient of a number and two. The quotient of two and a number. A number divided by three. Half of a number.	
Equal =		Two more than a number equals 5. When a number is divided by 2 and decreased by 3, the result is 2. Twice the sum of a number and 3 is 10.	

Jan 3-3:17 PM


Part B. **Writing Equations.** Write and solve an equation representing each sentence.

7. Three more than twice a number is 15.
8. Five times the sum of two and a number is 30.
9. The quotient of three less than a number and six equals 2.
10. Two more than the product of a number and 5 is 42.
11. A number is increased by seven, then doubled. The result is 10.

Part C. **Sentence Completion.** Write an expression to completes each sentence.

12. Anne has x apples. and Bobby has three more apples than Anne.
    Bobby has _____ apples.
13. Charlie is y years old. Denise is seven years older than half his age.
    Denise is _____ years old.
14. Emily has c cats and d dogs, and no other pets.
    Emily has _____ pets altogether.
15. Francine bought m movies at a price of $15 each.
    Francine paid _____ dollars.

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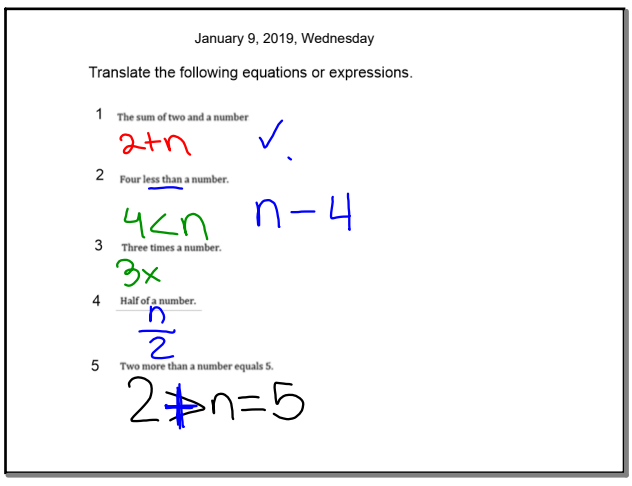

January 9, 2019, Wednesday

Translate the following equations or expressions.

1 The sum of two and a number
$2+n$ ✓

2 Four less than a number.
$4<n$ $n-4$

3 Three times a number.
$3x$

4 Half of a number.
$\frac{n}{2}$

5 Two more than a number equals 5.
$2+n=5$

Jan 3-3:19 PM

Algebra 1 ~ Day 5 **Naming, Adding, Subtracting, & Multiplying Polynomial Notes**

Monomials

- A monomial is: one term (coefficient and/or variable)

Polynomials

- A polynomial is the addition or subtraction of monomials.
- An example of a polynomial *in one variable, x,* would be $x^3 + 6x^2 + 12x + 8$
- How many monomials are there in the above polynomial? 4

Degree

- The largest exponent in the polynomial determines the degree of a polynomial in one variable.
- **Example**: The degree of $9 - 7x - 4x^2$ is 2 because 2 is the largest exponent in the polynomial.
- **Example**: Find the *degree* of the following polynomial: $x^4 + 6x^3 + 7x^5 + 12x$ 5

Standard Form

- The terms of a polynomial are in standard form if they are ordered from left to right in decreasing order; which means from the highest exponent to the least.
- The coefficient of the first term is called the leading coefficient.
- To write a polynomial in Standard Form, order the terms of the polynomial in decreasing order according to the exponents of the variables.
- **Example**: Write $9 + x - 4x^3$ in Standard Form: $-4x^3 + x^1 + 9$

Special Names:

Polynomial	# of terms	NAME by # of terms	degree	NAME by degree
12	1	monomial	0	constant
8x	1	monomial	1	linear
$4x^2 + 3$	2	binomial	2	quadratic
$5x^3 + x^2$	2	binomial	3	cubic
$3x^2 - 4x + 6$	3	trinomial	2	quadratic

Not Special!
$3x^3+2x^2+x-6$ 4 polynomial 3 cubic
$-4x^5+2x^4-3x^3-2x-1$ 5 polynomial 5 5th degree

Adding/Subtracting Polynomials:

Simplify each sum. Collect like terms.

1) $(6x^3 - 8x^2) + (4x^2 - 4x^3)$ Group
$(6x^3 - 4x^3) + (-8x^2 + 4x^2)$
$2x^3 + -4x^2$

2) $(8p^3 - 4p^2 - 2p) + (8p^3 - 4p^2 + p)$
$16p^3 - 8p^2 - 1p$

Simplify each difference.

3) $(6 + 6v^2) - (6 + 7v^2)$
$6 + 6v^2 - 6 - 7v^2$
$-1v^2$

4) $(6v^3 + 8v - 5v^4) - (7v - 5v^3 + 2v^4)$
$6v^3 + 8v - 5v^4 - 7v + 5v^3 - 2v^4$
$11v^3 + 1v - 7v^4$
Standard Form $-7v^4 + 11v^3 + v$

~~~~~~

Multiplying Polynomials: (Multiply the coefficient, but add the exponents)

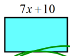
1. $-2x(x^2 - 4x + 2)$ – Use Distributive Property
$-2x^1(1x^2 - 4x^1 + 2)$
$-2x^3 + 8x^2 - 4x$

2. $(x + 3)(x - 3)$ – Use Box Method (multiplication)

	x^1	$+3$
x^1	x^2	$3x$
-3	$-3x$	-9

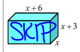
$= x^2 + 3x - 3x - 9$
$= x^2 - 9$

3. Find the **area** of the rectangle. $A = l \cdot w$

$7x + 10$

$4x + 8$

$(7x + 10)(4x + 8)$
$28x^2 + 56x + 40x + 80$
$28x^2 + 96x + 80$

4. Find the **volume**



U1 Day 5 ~ Adding & Subtracting Polynomials & Identifying Practice Name

Complete the chart below.

Polynomial	Rewrite in Standard Form (Term with largest exponent first, then decreasing order)	Degree (highest exponent)	Leading Coefficient (the number with the highest exponent)	Constant (number with no variable)	Monomial = 1, Binomial = 2, Trinomial = 3, Polynomial? > 3 terms	Constant = 0, Linear = 1, Quadratic = 2, Cubic = 3, Quartic? = 4 exponent
1) $-2 + 5x^1$	$5x^1 - 2$	1	5	-2	Bi	Linear
2) 12						
3) $-1 - 4x^2 + 7x$						
4) $5x^3 - 2$						
5) $4 - 3x^4$						
6) $x^2 + 5x + 2x^4 - x^3 + 1$						
7) $3x^3 - 10x + 15 + 6x^2$						
8) $7x - 3x^4$						

STOP

Find the sum or difference.

9. $(3x^2 - 4x + 1) + (-x^2 + x - 9)$

10. $(6x - 5) + (4x^2 - 3x + 4)$

11. $(5x^2 - x - 7) + (2x^2 + 3x + 4)$

12. $(x - 4x^2 + 7) - (-5x^2 + 5x - 3)$

13. $(-3 + 4n^2) - (5 - 2n^2)$

14. $(5x^2 - 3x) - (5x^2 - 3x + 1)$

15. $(3p^2 - 2p + 3) - (p^2 - 7p + 7)$

16. $(d^2 - d + 5) - (-d^2 + d + 5)$

17. $(5a + 9b) - (4b + 2a)$

18. $(x^3 - 3x^2y + 4xy^2 + y^3) - (7x^3 - 9x^2y + xy^2 + y^3)$

19. The length of a rectangle is represented by $3x$, the width is represented by $6x^2 + 4x$, what is the perimeter?

20. The length of a rectangle is $(3x - 5)$ and the width is $(x + 6)$. Write an expression for the perimeter of the rectangle.

21. The perimeter of a triangle is represented by the polynomial $6x^2 + 8x + 1$. Two of the sides of the triangle are represented by the expressions $2x^2 - 5x + 3$ and $2x^2 - 3x + 4$. Find an expression for the third side of the triangle.

Algebra 1 ~ U1 Day 5 Name

Polynomial Operations

Simplify each expression.

1) $(4p^2 + 2p) + (7p - 3p^2)$

2) $(8n^4 + 3n^2) - (6n^2 - 2n^4)$

3) $(5p^2 + p) + (5p^2 - 7p)$

4) $(7n^3 + n^4 - 7n) - (5n^4 - 4n^3)$

5) $(k^2 + 2k^3 - 8k^4) - (6k^2 - 5k^3)$

6) $(4x + 8x^3 + 4) + (2x^3 + 4)$

7) $(5v^2 - 8v + 2) + (8v - 4v^2 - 2)$

8) $(8p^4 - 6 - 3p^2) - (7p^2 - 2 - 7p^4)$

9) $(2b^3 - 5 + b^2) - (b^2 - 5b^4 - 6b^3)$

10) $(4x + 8x^4 + 6x^2) - (7x + 2x^3 + 2x^4) + (3x^2 + 5x + 4x^4)$

Find each product.

11) $2m(4m + 2)$

12) $4x(4x - 8)$

13) $6(4x^2 - 8x - 4)$

14) $6k(k^2 - 6k + 1)$

15) $(6n - 1)(7n - 2)$

16) $(5b - 5)(8b - 2)$

17) $(4p - 3)(5p - 4)$

18) $(2p - 1)(p + 4)$

19) $(k + 8)(6k + 6)$

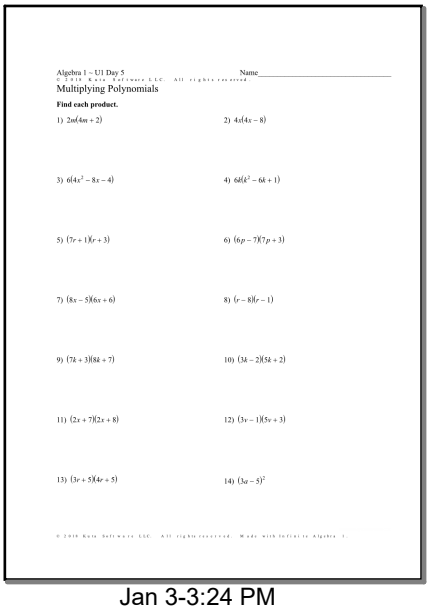
20) $(p - 6)(6p + 5)$

21) $(n + 1)(2n^2 + 6n - 8)$

22) $(2x + 7)(4x^2 - x - 3)$

23) $(8p^2 + 8p - 3)(4p^2 + p + 3)$

24) $(3a^2 + 7a + 8)(3a^2 - 5a - 1)$
~~~~~~



Algebra 1 ~ U1 Day 5 Name_____

Multiplying Polynomials

Find each product.

1) $2n(4n + 2)$
2) $4x(4x - 8)$
3) $6(4x^2 - 8x - 4)$
4) $6k(k^2 - 6k + 1)$
5) $(7r + 1)(r + 3)$
6) $(6p - 7)(7p + 3)$
7) $(8x - 5)(6x + 6)$
8) $(r - 8)(r - 1)$
9) $(7k + 3)(8k + 7)$
10) $(3k - 2)(5k + 2)$
11) $(2x + 7)(2x + 8)$
12) $(3r - 1)(5r + 3)$
13) $(3r + 5)(4r + 5)$
14) $(3a - 5)^2$

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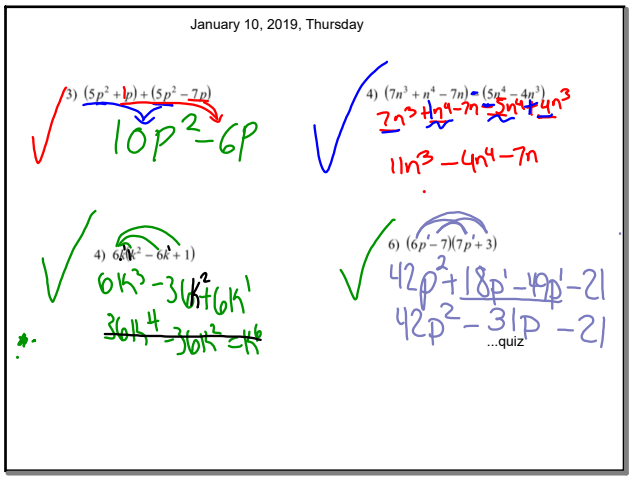


January 10, 2019, Thursday

3) $(5p^2 + 1p) + (5p^2 - 7p)$

$10p^2 - 6p$

4) $(7n^3 + n^4 - 7n) - (5n^4 - 4n^3)$

$7n^3 + n^4 - 7n - 5n^4 + 4n^3$

$11n^3 - 4n^4 - 7n$

4) $6k(k^2 - 6k^1 + 1)$

$6k^3 - 36k^2 + 6k^1$

$36k^4 - 36k^2 = 0$

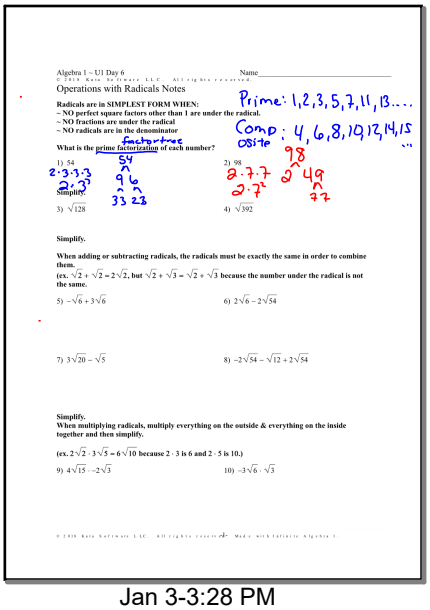
6) $(6p^1 - 7)(7p^1 + 3)$

$42p^2 + 18p^1 - 49p^1 - 21$

$42p^2 - 31p - 21$

...quiz

Jan 3-3:28 PM



Algebra 1 ~ U1 Day 6 Name_____

Operations with Radicals Notes

Radicals are in SIMPLEST FORM WHEN:
~ NO perfect square factors other than 1 are under the radical.
~ NO fractions are under the radical
~ NO radicals are in the denominator

Prime: 1, 2, 3, 5, 7, 11, 13, ...

Comp: 4, 6, 8, 10, 12, 14, 15, ...

opposite

What is the prime factorization of each number? factortree

1) 54 — $2 \cdot 3 \cdot 3 \cdot 3$ or $2 \cdot 3^3$
2) 98 — $2 \cdot 7 \cdot 7$ or $2 \cdot 7^2$

Simplify.

3) $\sqrt{128}$
4) $\sqrt{392}$

Simplify.

When adding or subtracting radicals, the radicals must be exactly the same in order to combine them.
(ex. $\sqrt{2} + \sqrt{2} = 2\sqrt{2}$, but $\sqrt{2} + \sqrt{3} = \sqrt{2} + \sqrt{3}$ because the number under the radical is not the same.

5) $-\sqrt{6} + 3\sqrt{6}$
6) $2\sqrt{6} - 2\sqrt{54}$
7) $3\sqrt{20} - \sqrt{5}$
8) $-2\sqrt{54} - \sqrt{12} + 2\sqrt{54}$

Simplify.
When multiplying radicals, multiply everything on the outside & everything on the inside together and then simplify.

(ex. $2\sqrt{2} \cdot 3\sqrt{5} = 6\sqrt{10}$ because $2 \cdot 3$ is 6 and $2 \cdot 5$ is 10.)

9) $4\sqrt{15} \div 2\sqrt{3}$
10) $-3\sqrt{6} \cdot \sqrt{3}$

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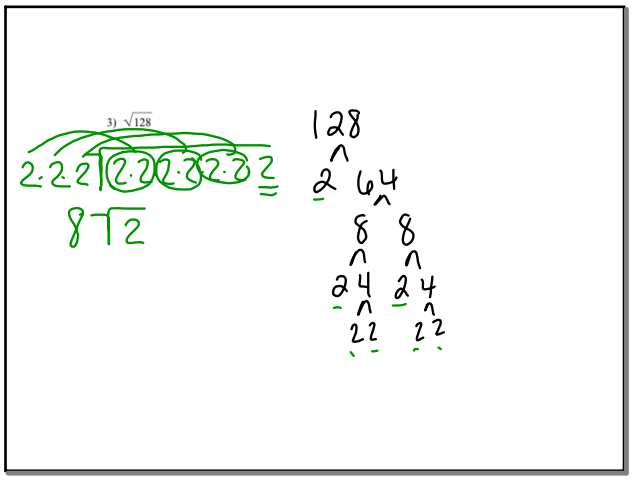


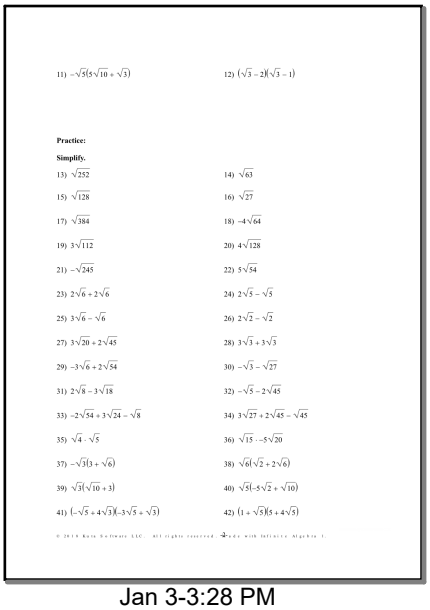
3) $\sqrt{128}$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

$8\sqrt{2}$

128 → 2, 64 → 8, 8 → 2, 4, 2, 4 → 2, 2, 2, 2

Jan 10-11:46 AM



11) $-\sqrt{5}(5\sqrt{10} + \sqrt{3})$
12) $(\sqrt{3} - 2)(\sqrt{3} - 1)$

Practice:

Simplify.

13) $\sqrt{252}$
14) $\sqrt{63}$
15) $\sqrt{128}$
16) $\sqrt{27}$
17) $\sqrt{384}$
18) $-4\sqrt{64}$
19) $3\sqrt{112}$
20) $4\sqrt{128}$
21) $-\sqrt{245}$
22) $5\sqrt{54}$
23) $2\sqrt{6} + 2\sqrt{6}$
24) $2\sqrt{5} - \sqrt{5}$
25) $3\sqrt{6} - \sqrt{6}$
26) $2\sqrt{2} - \sqrt{2}$
27) $3\sqrt{20} + 2\sqrt{45}$
28) $3\sqrt{3} + 3\sqrt{3}$
29) $-3\sqrt{6} + 2\sqrt{54}$
30) $-\sqrt{3} - \sqrt{27}$
31) $2\sqrt{8} - 3\sqrt{18}$
32) $-\sqrt{5} - 2\sqrt{45}$
33) $-2\sqrt{54} + 3\sqrt{24} - \sqrt{8}$
34) $3\sqrt{27} + 2\sqrt{45} - \sqrt{45}$
35) $\sqrt{4} \cdot \sqrt{5}$
36) $\sqrt{15} \div -5\sqrt{20}$
37) $-\sqrt{3}(3 + \sqrt{6})$
38) $\sqrt{6}(\sqrt{2} + 2\sqrt{6})$
39) $\sqrt{3}(\sqrt{10} + 3)$
40) $\sqrt{5}(-5\sqrt{2} + \sqrt{10})$
41) $(-\sqrt{5} + 4\sqrt{3})(-3\sqrt{5} + \sqrt{3})$
42) $(1 + \sqrt{5})(5 + 4\sqrt{5})$

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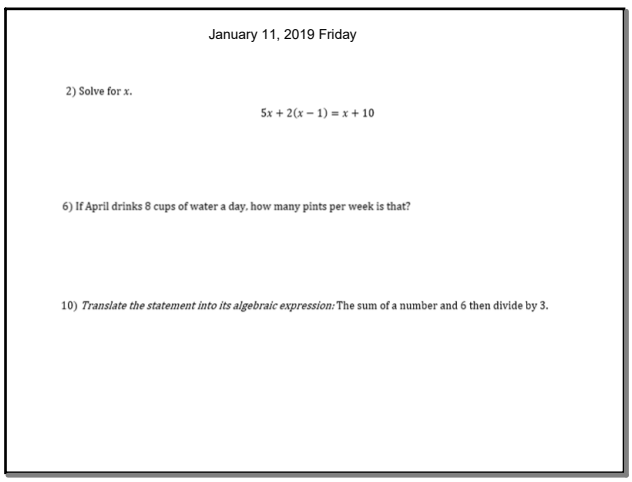

January 11, 2019 Friday

2) Solve for x.

$5x + 2(x - 1) = x + 10$

6) If April drinks 8 cups of water a day, how many pints per week is that?

10) *Translate the statement into its algebraic expression:* The sum of a number and 6 then divide by 3.

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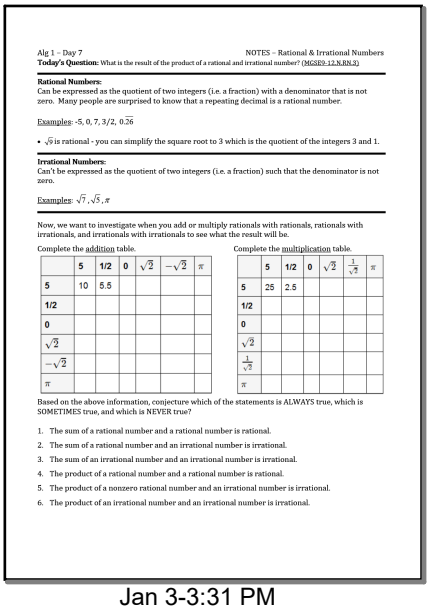

Alg 1 – Day 7 NOTES – Rational & Irrational Numbers

Today's Question: What is the result of the product of a rational and irrational number? (MGSE9-12.N.RN.3)

Rational Numbers:
Can be expressed as the quotient of two integers (i.e. a fraction) with a denominator that is not zero. Many people are surprised to know that a repeating decimal is a rational number.

Examples: -5, 0, 7, 3/2, $0.2\overline{6}$

- $\sqrt{9}$ is rational - you can simplify the square root to 3 which is the quotient of the integers 3 and 1.

Irrational Numbers:
Can't be expressed as the quotient of two integers (i.e. a fraction) such that the denominator is not zero.

Examples: $\sqrt{7}$, $\sqrt{5}$, π

Now, we want to investigate when you add or multiply rationals with rationals, rationals with irrationals, and irrationals with irrationals to see what the result will be.

Complete the addition table.

	5	1/2	0	$\sqrt{2}$	$-\sqrt{2}$	π
5	10	5.5				
1/2						
0						
$\sqrt{2}$						
$-\sqrt{2}$						
π						

Complete the multiplication table.

	5	1/2	0	$\sqrt{2}$	$\frac{1}{\sqrt{2}}$	π
5	25	2.5				
1/2						
0						
$\sqrt{2}$						
$\frac{1}{\sqrt{2}}$						
π						

Based on the above information, conjecture which of the statements is ALWAYS true, which is SOMETIMES true, and which is NEVER true?

1. The sum of a rational number and a rational number is rational.
2. The sum of a rational number and an irrational number is irrational.
3. The sum of an irrational number and an irrational number is irrational.
4. The product of a rational number and a rational number is rational.
5. The product of a nonzero rational number and an irrational number is irrational.
6. The product of an irrational number and an irrational number is irrational.

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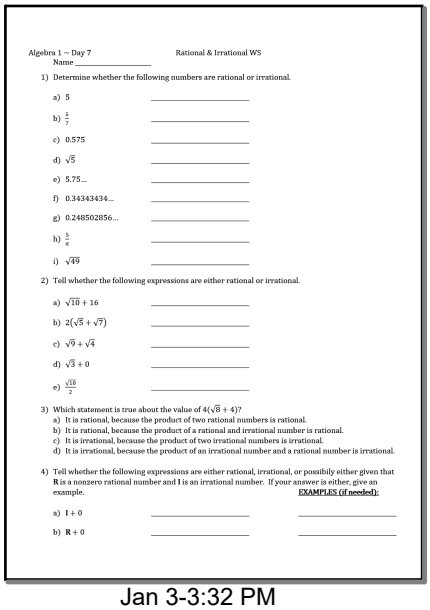

Algebra 1 ~ Day 7 Rational & Irrational WS

Name _____

1) Determine whether the following numbers are rational or irrational.

a) 5 _____

b) $\frac{5}{7}$ _____

c) 0.575 _____

d) $\sqrt{5}$ _____

e) 5.75... _____

f) 0.34343434... _____

g) 0.248502856... _____

h) $\frac{5}{\pi}$ _____

i) $\sqrt{49}$ _____

2) Tell whether the following expressions are either rational or irrational.

a) $\sqrt{10}+16$ _____

b) $2(\sqrt{5}+\sqrt{7})$ _____

c) $\sqrt{9}+\sqrt{4}$ _____

d) $\sqrt{3}+0$ _____

e) $\frac{\sqrt{16}}{2}$ _____

3) Which statement is true about the value of $4(\sqrt{8}+4)$?
a) It is rational, because the product of two rational numbers is rational.
b) It is rational, because the product of a rational and irrational number is rational.
c) It is irrational, because the product of two irrational numbers is irrational.
d) It is irrational, because the product of an irrational number and a rational number is irrational.

4) Tell whether the following expressions are either rational, irrational, or possibily either given that **R** is a nonzero rational number and **I** is an irrational number. If your answer is either, give an example. **EXAMPLES (if needed):**

a) **I** + 0 _____ _____

b) **R** + 0 _____ _____

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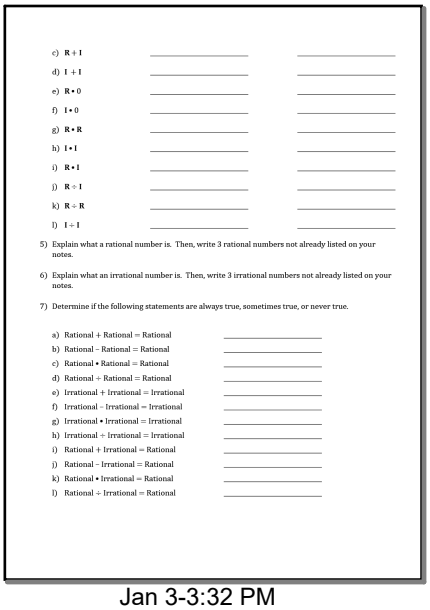

c) **R** + **I** _____ _____

d) **I** + **I** _____ _____

e) **R** • 0 _____ _____

f) **I** • 0 _____ _____

g) **R** • **R** _____ _____

h) **I** • **I** _____ _____

i) **R** • **I** _____ _____

j) **R** ÷ **I** _____ _____

k) **R** ÷ **R** _____ _____

l) **I** ÷ **I** _____ _____

5) Explain what a rational number is. Then, write 3 rational numbers not already listed on your notes.

6) Explain what an irrational number is. Then, write 3 irrational numbers not already listed on your notes.

7) Determine if the following statements are always true, sometimes true, or never true.

a) Rational + Rational = Rational _____
b) Rational – Rational = Rational _____
c) Rational • Rational = Rational _____
d) Rational ÷ Rational = Rational _____
e) Irrational + Irrational = Irrational _____
f) Irrational – Irrational = Irrational _____
g) Irrational • Irrational = Irrational _____
h) Irrational ÷ Irrational = Irrational _____
i) Rational + Irrational = Rational _____
j) Rational – Irrational = Rational _____
k) Rational • Irrational = Rational _____
l) Rational ÷ Irrational = Rational _____

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