Name:_____

Big Bend Community College

Emporium Model
Math 94 Course
Workbook

A workbook to supplement
video lectures and online homework by:

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Conversion Factors

LENGTH

English	Metric (meter)
12 in = 1 ft 3 ft = 1 yd 1 mi = 5280 ft	1000 mm = 1 m 100 cm = 1 m 10 dm = 1 m 1 dam = 10 m 1 hm = 100 m 1 km = 1000 m

English to Metric

1 in = 2.54 cm

VOLUME

English	Metric (liter)
8 fl oz = 1 cup (c) 2 cups (c) = 1 pint (pt) 2 pints (pt) = 1 quart (qt) 4 quarts (qt) = 1 gallon (gal)	1000 mL = 1 L 100 cL = 1 L 10 dL = 1 L 1 daL = 10 L 1 hL = 100 L 1 kL = 1000 L 1 mL = 1 cc = 1 cm^3

English to Metric

1 gallon (gal) = 3.79 liter (L)

$1 in^3$ = 16.39 mL

WEIGHT (MASS)

English	Metric (gram)
16 oz = 1 pound (lb) 2,000 lb = 1 Ton (T)	1000 mg = 1 g 100 cg = 1 g 10 dg = 1 g 1 dag = 10 g 1 hg = 100 g 1 kg = 1000 g

English to Metric

2.20 lb = 1 kg

TEMPERATURE

$$C = \frac{5(F-32)}{9}$$

$$F = \frac{9}{5}C + 32$$

TIME

60 seconds (sec) = 1 minute (min)
60 minutes (min) = 1 hour (hr)
24 hours (hr) = 1 day
52 weeks = 1 year
365 days = 1 year

INTEREST

Simple: $I = Prt$

Continuous: $A = Pe^{rt}$

Compound: $A = P\left(1 + \frac{r}{n}\right)^{nt}$

Annual: n=1
Semiannual: n=2
Quarterly: n=4

Geometric Formulas

Name	Diagram	Area
Rectangle	W, l	$A = lw$ $P = 2l + 2w$
Parallelogram	h, b	$A = bh$
Triangle	h, b	$A = \dfrac{1}{2}bh$
Trapezoid	a, h, b	$A = \dfrac{1}{2}h(a+b)$
Circle	d, r	$A = \pi r^2$ $C = \pi d = 2\pi r$

Name	Diagram	Volume
Rectangular Solid	h, w, l	$V = lwh$
Right Circular Cylinder	r, h	$V = \pi r^2 h$
Right Circular Cone	h, r	$V = \dfrac{1}{3}\pi r^2 h$
Sphere	r	$V = \dfrac{4}{3}\pi r^3$

Right Triangle

Pythagorean Theorem: $a^2 + b^2 = c^2$

Table of Contents

Unit 1:
Integers and Algebraic Expressions

To work through the unit, you should:

1. Watch a video, as you watch, fill out the workbook (top and example sections).
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1.1a Rounding Whole Numbers

Whole numbers are:

Place Value:

4,	2	8	7,	1	9	2

Rounding: Look at the _____ digit. Round up if it is _____ and round down if it is _____.

Example 1:

Round 5,459,246

To the nearest thousand

Q1:

Example 2:

Round 5,459,246

To the nearest hundred thousand

Q2:

Decimals are _____ of the _____

Place Value:

8.	1	7	2	6	9	3

Example 1:

Round 4.01276
To the nearest thousandth

Q1:

Example 2:

Round 4.01276
To the nearest hundredth

Q2:

To add we _____ place values and work _____ to _____ .

Example 1:

$$458+321$$

Q1:

Example 2:

$$716+485$$

Q2:

When adding decimals, we must _____ the _____

Place decimal:

Example 1:

$$4.21 + 8.962$$

Q1:

Example 2:

$$0.523 + 0.08$$

Q2:

To subtract we _____ place value and work _____ to _____.

Example 1:

$$967 - 341$$

Q1:

Example 2:

$$5037 - 2419$$

Q2:

When subtracting decimals, we must _____ the _____ .

Important: We may need additional _____ to line up!

Place decimal:

Example 1:

$$3.4 - 1.29$$

Q1:

Example 2:

$$4.03 - 0.051$$

Q2:

Integers:

Opposite means a _____ over _____ on the _____.

The symbol _____ means _____, _____ AND _____ !

Absolute Value is the _____ from zero. It is always _____.

_____

Example 1:

$$-(-6)$$

Example 2:

$$-(3)$$

Example 3:

$$|-8|$$

Example 4:

$$|4|$$

Example 5:

$$-|-7|$$

Example 6:

$$-|2|$$

Q1:

Q2:

Q3:

Q4:

Q5:

Q6:

Adding and Subtracting Integers: Keep the _____ with the _____ after it.

Rules for Dealing with Double Signs:

Adding a negative, or subtracting a positive, is the same as simple _____.

Subtracting a negative is the same as _____.

$$3+(-4)=$$

$$3-(-4)=$$

Visualize: $-2+(-3)$

Add with the same sign:

Example 1:

$$-7+(-4)$$

Q1:

Example 2:

$$(-6)+(-8)$$

Q2:

Visualize: $-2+4$

Visualize: $1+(-3)$

Adding with different signs:

Example 1:

$$5+(-2)$$

Example 2:

$$-9-(-4)$$

Q1:

Q2:

When adding and subtracting many integers we work _____ to _____ .

Example 1:

$$-5+(-2)-(-6)-4+8$$

Q1:

Example 2:

$$4-8+(-3)-(-1)+3$$

Q2:

STOP **You have completed the videos for 1.1 Adding and Subtracting Whole Numbers, Decimals, and Negatives. On your own paper, complete the homework assignment.**

Multiply _____ the digits together.

Use _____ to hold place value.

After multiplying we _____.

Different ways to show "multiply":

Example 1:

$$23 \bullet 56$$

Q1:

Example 2:

$$167(48)$$

Q2:

Place decimal:

Example 1:

$$4.2 \bullet 1.8$$

Q1:

Example 2:

$$2.6(3.52)$$

Q2:

Long division places the _____ number in front!

The leftovers:

Different ways to show "divide":

Example 1:

$$452 \div 13$$

Q1:

Example 2:

$$\frac{12024}{24}$$

Q2:

When dividing by zero, it helps to remember the _____ of division.

$6 \div 3$ implies how many _____ of 3 I have.

$0 \div 4$ implies how many _____ of 4 I have.

$6 \div 0$ implies how many groups of _____ I have.

Example 1:

$$20 \div 0$$

Q1:

Example 2:

$$\frac{0}{24}$$

Q2:

No decimals in the _____ or _____ .
Move the _____ in both the _____ and _____ .
If you run out of digits you can _____ .
Place decimal:

Example 1:

$$\frac{2.568}{2.4}$$

Q1:

Example 2:

$$19.5 \div 25$$

Q2:

A pattern to multiplying:

$$2 \cdot 2 =$$
$$2 \cdot 1 =$$
$$2 \cdot 0 =$$
$$2 \cdot (-1) =$$

Multiplying and dividing with a negative and a positive (or positive and negative) is a _____.

To remember: When _____ things happen to _____ people it is a _____ thing.

To remember: When _____ things happen to _____ people it is a _____ thing.

Example 1:

$$-54 \div 9$$

Q1:

Example 2:

$$3(-8)$$

Q2:

A pattern to multiplying:

$$-2 \cdot 2 =$$
$$-2 \cdot 1 =$$
$$-2 \cdot 0 =$$
$$-2 \cdot (-1) =$$

Multiplying and dividing a negative times a negative is a _____.
To remember: When _____ things happen to _____ people it is a _____ thing.

Example 1:

$$-7(-4)$$

Q1:

Example 2:

$$\frac{-15}{-3}$$

Q2:

🛑 **You have completed the videos for 1.2 Multiplying and Dividing Whole Numbers, Decimals, and Negatives. On your own paper, complete the homework assignment.**

1.3a Exponents

Exponents are_____.

$5^3 =$

Example 1:

$$2^5$$

Q1:

Example 2:

$$7^2$$

Q2:

Exponents only effect what they are _____.

$$\left(-5\right)^2 = -5^2 =$$

Example 1:

$$-3^4$$

Q1:

Example 2:

$$\left(-2\right)^6 =$$

Q2:

Why we need an order: $2+3(4)$ $2+3(4)$

The order:

Example 1:

$$2^3 +5(4-7)$$

Q1:

Example 2:

$$24 \div 6 \bullet 2 - 3^2 (7-9)$$

Q2:

Absolute values work just like _____ but makes the number inside _____

after it has been _____ .

Example 1:

$$3 - 2\left|7 - 4^2\right|$$

Q1:

Example 2:

$$\left|4(2) - 6\right|^3 - 4^2$$

Q2:

Simplify numerator _____

Simplify denominator _____

Last _____

Example 1:

$$\frac{2 \bullet 4^3 - 4(32)}{2(-1)^2}$$

Q1:

Example 2:

$$\frac{2^3 - 4^2}{2^3 - 10}$$

Q2:

STOP **You have completed the videos for 1.3 Exponents and Order of Operations. On your own paper, complete the homework assignment.**

1.4 Simplify Algebraic Expressions

1.4a Substitute a Value

I have a _____ eggs, this means I have _____ eggs.

Variables are _____ that represent _____ amounts.

If we know the amount, we can _____ it in an expression.

Whenever we make a substitution or _____ put it in _____.

Example 1:

Evaluate: $-x^2 - 7x - 12$
When $x = -4$

Q1:

Example 2:

Evaluate: $b^2 - 4ac$
When $a = 2, b = -3,$ and $c = -5$

Q2:

An equation is made up of two _____ expressions.
A solution is the value of the _____ that makes the equation _____ .

Example 1:

Is $x = 3$ the solution to
$-2x + 7 = 1$?

Q1:

Example 2:

Is $x = -3$ the solution to
$2x - 5 = 7x + 5$?

Q2:

John has 5 cats and 3 dogs. Sue has 2 cats and 1 dog. Together they have _____ cats and _____ dogs.

Terms are _____ and _____ that are _____ together.

Like terms are terms that have matching _____ and _____.

Combine like terms: _____ the coefficients or _____ from _____.

Example 1:

$$9x + 2y - 7x - 5y + 2x$$

Q1:

Example 2:

$$5x^2 - 2x - 9 + 4x - 7x^2 + 6$$

Q2:

Multiplication is _____

$$3(2x+5) =$$

Distributive Property: $3(2x+5)$

Example 1:

$$-4(2x+5y-7)$$

Q1:

Example 2:

$$7(9x^2 - 7x + 8)$$

Q2:

Order of operations states we _____ before we _____ .

Therefore, we will _____ first and then _____ second.

Example 1:

$$5(2x+6y-2)-4(x+3-6y)$$

Q1:

Example 2:

$$2(4x^2-6x+1)-(x^2+5x+3)$$

Q2:

Perimeter:

Find the perimeter by _____ the sides together.

Example 1:

$8 - 4x$ $3x + 7$

$-9 - 2x$

Q1:

Example 2:

$7 - 2x$

$5x - 4$

$3 + x$

3

$6 - 4x$

$1 - x$

Q2:

🛑 **You have completed the videos for 1.4 Simplify Algebraic Expressions. On your own paper, complete the homework assignment.**

🛑 **Congratulations! You made it through the material for Unit 1: Integers and Algebraic Expressions. It is time to prepare for your exam. On a separate sheet of paper, complete the review/practice test. Once you have completed the review/practice test, ask your instructor to take the test. Good luck!**

Unit 2:
Fractions

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2.1 Prime Factorization
2.1a Prime and Composite

Prime numbers are divisible by _____ and _____.

Examples of Primes:

Composite numbers are divisible by _____.

Example 1:

          Prime or Composite:
               89

Q1:

Example 2:

          Prime or Composite:
              147

Q2:

A number is divisible by a smaller number if the small number _____ into the number.

Divisibility tests:

2:

3:

5:

7, 11, 13, 17, 19:

Example 1:

    2730 is divisible by which prime numbers?

Q1:

Example 2:

    133 is divisible by which numbers?

Q2:

Prime Factorization: a _____ of _____ numbers.

To find a prime factorization we divide by _____ .

Example 1:

Find the prime factorization of
360

Q1:

Example 2:

Find the prime factorization of
1224

Q2:

You have completed the videos for 2.1 Prime Factorization. On your own paper, complete the homework assignment.

2.2a Introduction to Fractions

Fraction is a _____ of a _____.

Example: $\dfrac{4}{5}$ where the 4 is the _____, called the _____ and the 5 is the _____ called the _____.

Example 1:

What fraction is shaded?

Q1:

Example 2:

What fraction is shaded?

Q2:

Equivalent fractions:

To find an equivalent fraction _____ the _____ and __
_____ by the _____

Example 1:

    Find three equivalent fractions:
$$\frac{3}{7}$$

Q1:

Example 2:

    Find three equivalent fractions:
$$\frac{4}{3}$$

Q2:

Reduced Fraction: The _____ and _____ have no common _____.

To reduce we find the _____ and divide out _____.

Example 1:

Simplify:

$$\frac{24}{36}$$

Q1:

Example 2:

Simplify:

$$\frac{105}{70}$$

Q2:

Sometimes we can _____ the common factors and _____.

Example 1:

$$\frac{24}{36}$$

Q1:

Example 2:

$$\frac{105}{70}$$

Q2:

When reducing with variables, _____ the variables that are in _____.

With exponents it may help to _____.

Example 1:

$$\frac{4x^2yz}{10xy^3}$$

Q1:

Example 2:

$$\frac{27a^3bc}{9a^2b^2c}$$

Q2:

The fraction bar represents _____.

To convert a fraction to a decimal we _____.

To work through this process, we will use _____.

If the decimal repeats we will use a _____.

Example 1:

Convert to decimal: $\dfrac{7}{32}$

Q1:

Example 2:

Convert to decimal: $\dfrac{32}{99}$

Q2:

To convert a decimal to a fraction we use _____ of the last digit.

Last check to see if the fraction can be _____

Example 1:

Convert to a fraction:
0.43

Q1:

Example 2:

Convert to a fraction:
0.2435

Q2:

You have completed the videos for 2.2 Reduce Fractions. On your own paper, complete the homework assignment.

Multiply the _____ together and multiply the _____ together.

Example 1:

$$\frac{4}{7} \,\square\, \frac{5}{3}$$

Q1:

Example 2:

$$\frac{1}{6} \,\square\, \frac{5}{4}$$

Q2:

Consider: $\dfrac{4}{9}\square\dfrac{6}{5}=$

But if we factor each: $\dfrac{4}{9}\square\dfrac{6}{5}=$

When _____ we can _____ a common factor from the _____ and _____.

Example 1:

$$\dfrac{6}{35}\square\dfrac{14}{15}$$

Q1:

Example 2:

$$\dfrac{6}{14}\square\dfrac{35}{13}$$

Q2:

With exponents on variables it may help to _____

Remember, repeated _____ is done with _____

Example 1:

$$\frac{6x^2y}{7} \square \frac{14y}{3x}$$

Q1:

Example 2:

$$\frac{30a}{3b^2} \square \frac{21ab}{10}$$

Q2:

Whole numbers can be made into fractions by putting them over _____.

Example 1:

$$\frac{3}{8} \cdot 20$$

Q1:

Example 2:

$$35 \cdot \frac{6}{7}$$

Q2:

Reciprocal:

Reciprocals multiply to _____.

Example 1:

Find the reciprocal of $\dfrac{6}{5}$

Q1:

Example 2:

Find the reciprocal of -8

Q2:

Divide fractions by _____ by the _____ .

Example 1:

$$\frac{14}{15} \div \frac{35}{6}$$

Example 2:

$$\frac{3}{10} \div \frac{6}{15}$$

Q1:

Q2:

With exponents on variables it may help to _____

Remember, repeated _____ is done with _____

Example 1:

$$\frac{10x}{3y^2} \div \frac{10}{21xy}$$

Example 2:

$$\frac{14m}{3n} \div \frac{7}{6m^2n}$$

Q1:

Q2:

Whole numbers can be made into fractions by putting them over _____.

Example 1:

$$28 \div \frac{7}{8}$$

Q1:

Example 2:

$$\frac{4}{9} \div 14$$

Q2:

STOP **You have completed the videos for 2.3 Multiply and Divide Fractions. On your own paper, complete the homework assignment.**

2.4 Least Common Multiple
2.4a Multiples

Multiples are found by _____ by other numbers.

Example 1:

Find the first three multiples of 8

Q1:

Example 2:

Find the first three multiples of -7

Q2:

Least Common Multiple (LCM):

Multiples of 15:

Multiples of 20:

Common multiples of 15 and 20:

Least common multiple of 15 and 20:

Using mental math: Test _____ of the _____ number: Can it be divided by the _____

Example 1:

Find the LCM of 12 and 9

Q1:

Example 2:

Find the LCM of 20 and 4

Q2:

To find an LCM of two larger numbers:

1. Find the _____ of each

2. Use all the unique _____

    Assign the _____ to each factor

Example 1:

Find the LCM of 24 and 36

Q1:

Example 2:

Find the LCM of 54 and 90

Q2:

To find the LCM with variables:

1. Use all the unique _____

2. Assign the _____ to each variable

Example 1:

Find the LCM of a^3b^2c and $a^2b^7d^2$

Q1:

Example 2:

Find the LCM of $6x^2z$ and $8x^3y^2$

Q2:

You have completed the videos for 2.4 Least Common Multiple. On your own paper, complete the homework assignment.

Consider: $\dfrac{2}{5} + \dfrac{1}{5}$

To add fractions that have the same denominator: _____ numerators and _____ denominators.

When adding fractions always check to _____ at the _____ of the problem.

Example 1:

$$\dfrac{4}{7} - \dfrac{2}{7}$$

Q1:

Example 2:

$$\dfrac{7}{10} + \dfrac{5}{10}$$

Q2:

If the denominators don't match, we will find the _____.

Multiply _____ by missing factors.

Then multiply the _____ by the _____ factors.

If you do not know the LCD you can always _____ the two _____.

Example 1:

$$\frac{5}{3} + \frac{4}{9}$$

Q1:

Example 2:

$$\frac{3}{4} - \frac{5}{6}$$

Q2:

We may have to use _____ to find the LCD.

To build up to the LCD we multiply by any _____ factors.

Example 1:

$$\frac{7}{24} + \frac{11}{36}$$

Q1:

Example 2:

$$\frac{5}{54} - \frac{7}{90}$$

Q2:

🛑 **You have completed the videos for 2.5 Add and Subtract Fractions. On your own paper, complete the homework assignment.**

Exponents mean _____

$$\left(\frac{2}{3}\right)^2 =$$

Or we could put the exponent on the _____ and _____

Example 1:

$$\left(\frac{3}{2}\right)^3$$

Q1:

Example 2:

$$\left(\frac{7}{4}\right)^2$$

Q2:

The order

1.

2.

3.

4.

You may need some _____

Example 1:

$$\frac{9}{10} \div \frac{12}{5} + \left(\frac{5}{2}\right)^2 \square \frac{1}{30}$$

Example 2:

$$\left(\frac{8}{5}\right)^2 - \frac{9}{10} \left|\frac{7}{3} - \frac{9}{2}\right|$$

Q1:

Q2:

STOP **You have completed the videos for 2.6 Order of Operations with Fractions. On your own paper, complete the homework assignment.**

2.7 Mixed Numbers
2.7a Mixed Numbers and Conversions

Mixed number:

Change a mixed number to a fraction: _____ the whole and _____

and _____ the _____.

Change a fraction to a mixed number: _____, the remainder is the new _____.

Example 1:

$$\text{Convert } 5\frac{9}{11} \text{ to a fraction}$$

Q1:

Example 2:

$$\text{Convert } \frac{73}{12} \text{ to a mixed number}$$

Q2:

To do math with mixed numbers it is easiest to _____ to a _____

When you have your answer, _____

Example 1:

$$5\frac{2}{5} + 7\frac{3}{10}$$

Q1:

Example 2:

$$-2\frac{1}{3} + 6\frac{4}{9}$$

Q2:

To do math with mixed numbers it is easiest to _____ to a _____.

When you have your answer, _____.

Example 1:

$$2\frac{4}{5} \square 3\frac{4}{7}$$

Q1:

Example 2:

$$5\frac{1}{3} \div 2\frac{1}{6}$$

Q2:

STOP **You have completed the videos for 2.7 Mixed Numbers. On your own paper, complete the homework assignment.**

STOP **Congratulations! You made it through the material for Unit 2: Fractions. It is time to prepare for your exam. On a separate sheet of paper, complete the review/practice test. Once you have completed the review/practice test, ask your instructor to take the test. Good luck!**

Unit 3:
Linear Equations

To work through the unit, you should:

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7. Take the unit exam.

3.1 One Step Equations
3.1a Addition Principle

A _____ to an equation is the value for the _____ that makes the equation _____.

We can _____ anything to _____ of the equation.

Addition Principle: To move a negative term we do the opposite and _____ it to _____.

Very Important to _____ your work!

Example 1:

$$x - 9 = 4$$

Q1:

Example 2:

$$-3 = -5 + x$$

Q2:

We can _____ anything to _____ of the equation.

Subtraction Principle: To move a positive term we do the opposite and _____ it from _____.

Very Important to _____ your work!

Example 1:

$$x + 8 = -4$$

Q1:

Example 2:

$$3 = 7 + x$$

Q2:

We can _____ anything to _____ of the equation.

Division Principle: To undo multiplication of factors we do the opposite and _____ it from _____ _____ .

Very Important to _____ your work!

Example 1:

$$7x = 147$$

Q1:

Example 2:

$$-8x = 72$$

Q2:

We can _____ anything to _____ of the equation.

Multiplication Principle: To clear division we do the opposite and _____ it by _____.

Very Important to _____ your work!

Example 1:

$$\frac{x}{7} = -4$$

Q1:

Example 2:

$$5 = \frac{x}{-2}$$

Q2:

🛑 **You have completed the videos for 3.1 One Step Equations. On your own paper, complete the homework assignment.**

Simplifying we use order of operations and we _____ before we _____ .

Solving we work _____ and we _____ before we _____ .

Example 1:

$$5x - 7 = 8$$

Q1:

Example 2:

$$-9 = -5 - 2x$$

Q2:

If there is no number in front of a variable, we assume there is a _____ in front.

This means $-x$ is the same as _____ .

Example 1:

$$-x + 8 = 5$$

Q1:

Example 2:

$$-4 = -6 - x$$

Q2:

STOP **You have completed the videos for 3.2 Two Step Equations. On your own paper, complete the homework assignment.**

When solving an equation, we want the variable on _____.

If the variable is on both sides, we will _____ the _____ one by _____.

Example 1:

$$5x + 7 = 9x - 2$$

Q1:

Example 2:

$$-6x + 1 = 2x - 12$$

Q2:

Before we solve, we must _____ the _____ and _____ sides.

One way to do this is _____.

Example 1:

$$5x - 3 - 2x = 7 + 8x - 1$$

Q1:

Example 2:

$$4 + x - 2 = -3x + 8 + 2x$$

Q2:

Before we solve, we must _____ the _____ and _____ sides.

One way to do this is _____ .

Example 1:

$$2(3x-1)=4x+6-x$$

Q1:

Example 2:

$$3(2x+1)-9x=4(x+6)-20$$

Q2:

STOP **You have completed the videos for 3.3 General Linear Equations. On your own paper, complete the homework assignment.**

3.4 Equations with Decimals and Fractions
3.4a Decimals

When solving with decimals the pattern of solving is _____.

A _____ may be helpful to speed up calculations.

Example 1:

$$3.2x + 7.11 = -19.77$$

Q1:

Example 2:

$$2.1(x - 4.3) = 5.7x - 9.19 - 3.8x$$

Q2:

If the equation has fractions, we can clear the fractions by _____ each term by the ____.

After multiplying we can _____ to get an equation with no _____.

Example 1:

$$\frac{5}{6}x - \frac{1}{3} = \frac{7}{2}$$

Q1:

Example 2:

$$\frac{3}{8}x + \frac{3}{4} = -5 + \frac{7}{2}x$$

Q2:

STOP **You have completed the videos for 3.4 Equations with Decimals and Fractions. On your own paper, complete the homework assignment.**

STOP **Congratulations! You made it through the material for Unit 3: Linear Equations. It is time to prepare for your exam. On a separate sheet of paper, complete the review/practice test. Once you have completed the review/practice test, ask your instructor to take the test. Good luck!**

Unit 4:
Stats, Graphing,
Proportions and Percent

(You may use a calculator on this unit)

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5. Repeat #1 thru #4 until you reach the end of the unit.
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7. Take the unit exam.

4.1a Mean

Mean: The average if all items were the _____ or spread out _____.

To calculate the mean:

Example 1:

Find the Mean:
$5, 8, 6, 7, 9, 4, 8, 10$

Q1:

Example 2:

Find the Mean:
$23, 26, 27, 21, 26, 22, 73, 24, 23$

Q2:

The mean is when all the items are the _____ or spread out _____ .

If we know the mean and are missing a value, calculate the _____ using the _____ .

Example 1:

On three tests a student earns 83%, 71%, and 81%. What must she earn on her fourth test to raise her average of the four tests up to 80%?

Q1:

Example 2:

Another student has a goal of 90% on his four tests. On the first three tests he earned 92%, 75%, and 89%. Is it possible for him to reach his goal of 90%? What score would he have to earn?

Q2:

Weighted average: Values that occur _____ have a larger _____ on the average (mean).

To calculate the total, we _____ the _____ by the _____ .

Example 1:

In a survey, students were asked how many siblings they had. The results are below. Calculate the average number of siblings of the survey responders.

Siblings	Responses
0	8
1	38
2	21
3	15
4	2

Q1:

Example 2:

Grade Point Average (GPA) is calculated as a weighted average. The credits of a course are considered the "frequency" of the course. In this way, classes that are more credits have a larger effect on grade than classes with fewer credits. Calculate the GPA of the following report card:

Class	Credits	Grade
English	4	3.2
Math	5	4.0
History	3	2.8
PE	1	0.7

Q2:

Median: The average at which _____ the data is _____ and _____ is _____.

To calculate the median:

If two values are in the middle:

Example 1:

Find the Median:
5,8,6,7,9,4,8,10

Q1:

Example 2:

Find the Median:
23,26,27,21,26,22,73,24,23

Q2:

Mode: the average or value that occurs _____.

It is possible to have _____ modes or _____ mode.

Example 1:

Find the Mode:
$5,8,6,7,9,4,8,10$

Q1:

Example 2:

Find the Mode:
$23,26,27,21,26,22,73,24,23$

Q2:

STOP **You have completed the videos for 4.1 Averages. On your own paper, complete the homework assignment.**

Probability:

Basic Probability Fraction:

Example 1:

A bag contains 3 blue marbles, 2 red marbles and 1 green marble. If you were to draw one marble at random, what is the probability of drawing...

1) A blue marble?

2) A red marble?

3) A black marble?

Q1:

Example 2:

If you roll a standard six-sided die, what is the probability you roll…

1) A three?

2) An even number?

3) A number smaller than three?

4) A seven?

Q2:

The probability of this OR that: we _____ the individual probabilities.

The probability of this AND that: we _____ the individual probabilities.

Example 1:

A bag contains 3 blue marbles, 2 red marbles and 1 green marble. If you were to draw one marble at random, what is the probability of drawing...

1) A blue or green marble?

2) A green or red marble?

3) A blue or red or green marble?

Q1:

Example 2:

If you roll a standard six-sided die and then draw a marble out of a bag with 7 red and 3 black marbles, what is the probability you get…

1) A three and a black?
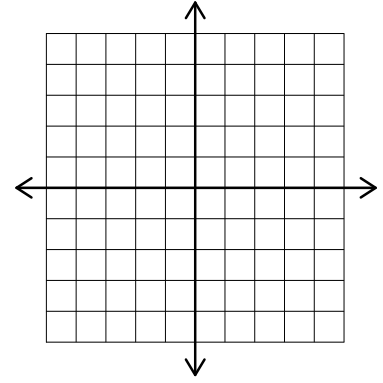
2) An even and a red?

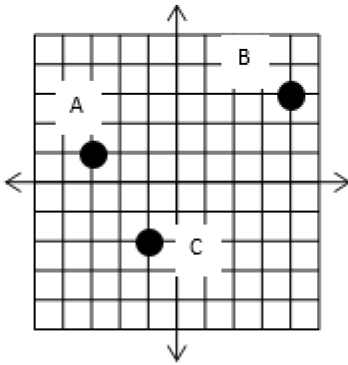**Q2:**

Coordinate Plane:

x-axis:

y-axis:

Origin:

Coordinate Point:

Example 1:
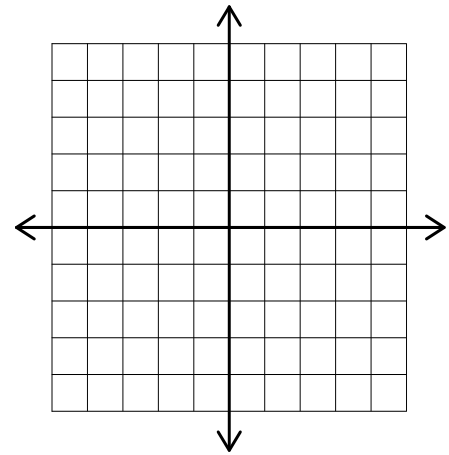
Give the coordinates of points A, B, and C

Q1:

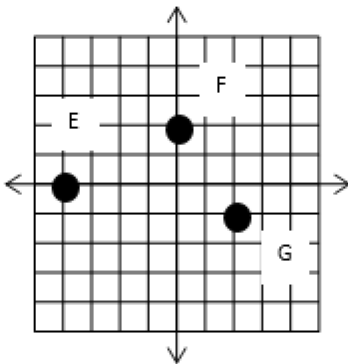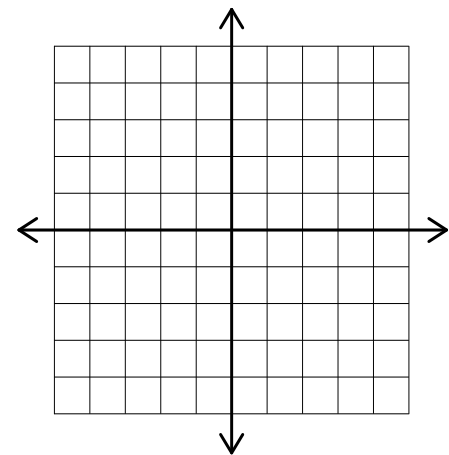**Example 2:**

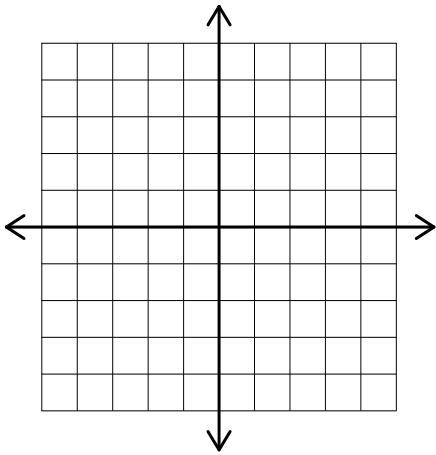Give the coordinates of points E, F, and G

Q2:

To plot a point start at the _____ and move _____ then _____.

Negatives move the point _____.

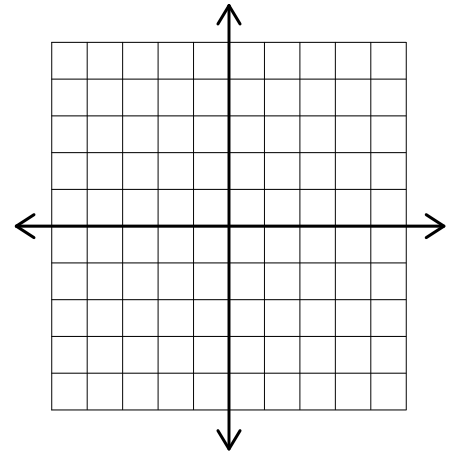**Example 1:**

Plot the points:
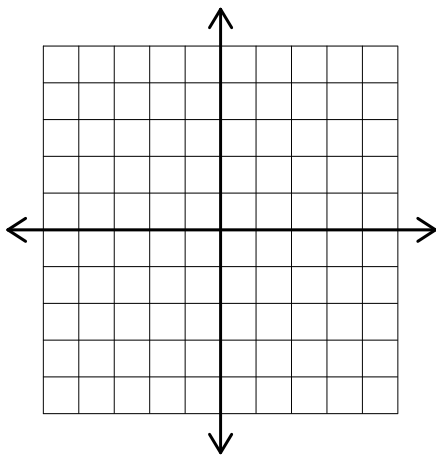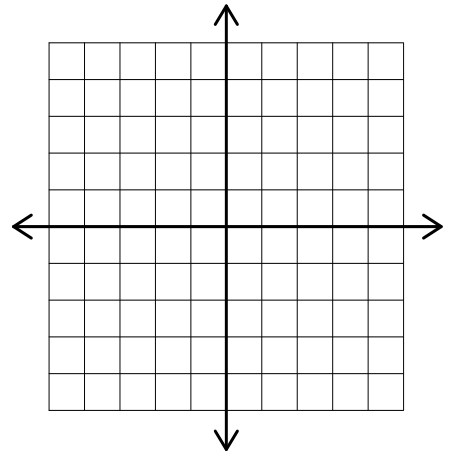$$A(2,-4), B(-3,-1), C(0,2), D(-3,4)$$

Q1:

Example 2:

Plot the points:
$$E(1,2), F(-1,0), G(0,0)$$

Q2:

🛑 **You have completed the videos for 4.2 Probability and Plotting Points. On your own paper, complete the homework assignment.**

Rate: Amount per _____

To set up, the word _____ is the _____.

Example 1:

Rafael made $22,512 last year. What is his rate of pay per month?

Q1:

Example 2:

Giovanni covered his 2,500 square foot yard with 700 ounces of fertilizer. What is the rate of coverage the fertilizer can cover in ounces per square foot?

Q2:

Unit Rate: Rate of _____ per _____ .

Use unit rates to identify the _____ .

Example 1:

A 20-ounce bottle of soda sells for $1.99. What is the unit price?

Q1:

Example 2:

Lemon juice comes in a 24 oz bottle and a 32 oz bottle. The 24 oz bottle sells for $1.98 and the 32 oz bottle sells for $2.98. Which is the better deal and what is the unit price?

Q2:

You have completed the videos for 4.3 Rates and Unit Rates. On your own paper, complete the homework assignment.

To solve a proportion, we _____ both sides by the _____.

The quick method: Multiply by the _____.

Example 1:

$$\frac{7}{x} = \frac{6}{5}$$

Q1:

Example 2:

$$\frac{8}{5} = \frac{x}{3}$$

Q2:

When solving applications, we must first identify what we are _____.

Clearly label the _____ and _____ of the proportion.

Example 1:

A 65-inch-tall man wants to determine how tall a large tree is. He noticed at a certain time his shadow was 14 inches long. When he measured the shadow of the tree, he found it was 48 inches long. How tall is the tree?

Q1:

Example 2:

A manufacturer knows that out of every 300 parts the company ships, on average 18 are defective. If the company ships 5800 parts in a day, how many will be defective?

Q2:

 You have completed the videos for 4.4 Proportions and Applications. On your own paper, complete the homework assignment.

4.5a Convert Percent and Decimals

Percent:

To convert a decimal to a percent: Multiply by _____ or move the decimal _____ to the _____.

To convert a percent to a decimal: Divide by _____ or move the decimal _____ to the _____.

Example 1:

Convert 0.582 to a percent

Q1:

Example 2:

Convert 145.6% to a decimal

Q2:

To convert a fraction to a percent: First _____ then convert the _____ to a _____.

To convert a percent to a fraction: Put the percent over _____ and _____.

Example 1:

Convert $\dfrac{17}{20}$ to a percent

Q1:

Example 2:

Convert 32% to a fraction

Q2:

🛑 **You have completed the videos for 4.5 Introduction to Percent. On your own paper, complete the homework assignment.**

Key words to translate:

- What

- Is

- Of

- Percent

Example 1:

What is 70% of 40?

Q1:

Example 2:

45% of what is 70?

Q2:

Discount Equation:

Example 1:

A computer that normally costs $549 is on sale at 22% off. What is the new price of the computer?

Q1:

Example 2:

A desk that normally sells for $224 is on sale for $188.16. What is the percent discount?

Q2:

Sales Tax Equation:

Example 1:

What is the sales tax on a $499 television if the tax rate is 8.5%? What would you pay for the TV?

Q1:

Example 2:

Marc purchased a $390 table and paid $25.35 in sales tax. What is the tax rate?

Q2:

Commission Equation:

Example 1:

A cell phone company pays a 14% commission to its representatives. If an employee sells $23,000 worth of product in a month, how much will she be paid?

Q1:

Example 2:

A real estate agent sold $845,000 worth of properties and earned $16,900 in his commission. What is his commission rate?

Q2:

Interest:

Simple Interest Equation:

Time must be in _____ .

Example 1:

A bank account pays 2.1% simple interest on a certain account. If you invest $3500 for 4 years, how much will you earn in interest?

Q1:

Example 2:

A bank gives a loan with 4.5% simple interest for 9 months on a $12,000 loan. How much is owed back to the bank at the end of the loan?

Q2:

STOP **You have completed the videos for 4.6 Translate Percent and Applications. On your own paper, complete the homework assignment.**

Percent Proportion:

Example 1:

What percent of 25 is 16?

Q1:

Example 2:

14 is 60% of what?

Q2:

"OF" represents _____

"IS" represents _____

Example 1:

Among male smokers, the lifetime risk of developing lung cancer is 17.2%. According to the Washington State Department of Health, in 2011 the state had 760,000 smokers. How many are at risk of developing lung cancer in their lifetime?

Q1:

Example 2:

In 2010, women made up 58% of Big Bend Community College's students. If there were 1688 women enrolled in 2010, how many students were there total?

Q2:

Percent Increase/Decrease Proportions:

Example 1:

The price of a sofa was $299. During a weekend sale the price was dropped to $179. What was the percent decrease?

Q1:

Example 2:

The population of a small town was 12,345 in 2000. This represents a decrease of 39.3% from 1990. What was the population in 1990?

Q2:

STOP **You have completed the videos for 4.7 Percents as Proportions and Applications. On your own paper, complete the homework assignment.**

STOP **Congratulations! You made it through the material for Unit 4: Stats, Graphing, Proportions, and Percents. It is time to prepare for your exam. On a separate sheet of paper, complete the review/practice test. Once you have completed the review/practice test, ask your instructor to take the test. Good luck!**

Unit 5:
Geometry and Intro to Polynomials

(You may use a calculator on this unit)

To work through the unit, you should:

1. Watch a video, as you watch, fill out the workbook (top and example sections).
2. Complete Q1 and Q2 in WAMAP, put your work in the right column of the page.
3. Repeat #1 and #2 with each page until you reach the 🛑.
4. Complete the homework assignment on your own paper.
5. Repeat #1 thru #4 until you reach the end of the unit.
6. Complete the review/practice test on your own paper.
7. Take the unit exam.

5.1 Convert Units
5.1a One Step Conversions

Consider: $\left(\dfrac{57\,in}{1}\right)\left(\dfrac{1\,ft}{12in}\right) =$

Divide out units by placing them in the _____ part of the fraction.

Conversion factor: Same _____ in numerator and denominator, but different _____.

Dimensional analysis: Multiply by a _____ to convert units.

Example 1:

$$17.2 \text{ mi} = \underline{\hspace{2cm}} \text{ km}$$

Q1:

Example 2:

$$88 \text{ lbs} = \underline{\hspace{2cm}} \text{kg}$$

Q2:

If we do not have the correct conversion factor, we can convert using _____ conversion factors.

Example 1:

365 g = _____ lbs

Q1:

Example 2:

5 gal = _____ cups

Q2:

Dual Unit:

"Per" is the _____ .

With dual units we convert _____ .

Example 1:

    35 mi per hr = _____ ft per sec

Q1:

Example 2:

    45 oz per min = _____ lbs per hr

Q2:

You have completed the videos for 5.1 Convert Units. On your own paper, complete the homework assignment.

Area of a rectangle:

Area of a parallelogram:

Important: Height must meet the base at a perfect _____ angle.

Example 1:

Find the area:

8 in

15 in

Example 2:

Find the area:

7 cm

9 cm

21 cm

Q1:

Q2:

Area of a triangle:

Important: Height must meet the base at a perfect _____ angle.

Example 1:

Find the area:

5 ft

8 ft

Q1:

Example 2:

Find the area:

5 m   3 m
4.3 m

6 m

Q2:

Area of a trapezoid:

The bases (a and b) must be _____.

The _____ connects the two _____.

Important: height must meet the base at a perfect _____ angle.

Example 1:

Find the area:

12 cm

5 cm   4 cm   5 cm

6 cm

Q1:

Example 2:

Find the area:

5 in

9 in

2 in

4 in

Q2:

Diameter:

Radius:

$\pi =$

Area of a Circle:

Example 1:

Find the area:

4 ft

Q1:

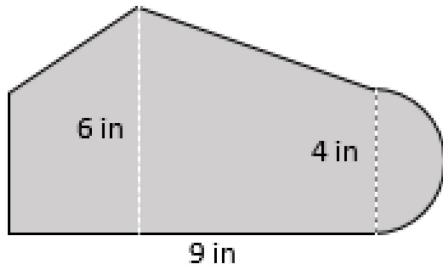
Example 2:

Find the area:

12 cm

Q2:

If we do not have a formula for a shape, we must _____.

Shapes attached to each other are _____.
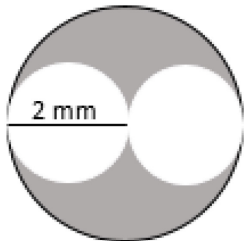
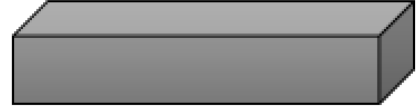Shapes cut out are _____.

Example 1:

Find the area:

6 in

4 in

9 in

Q1:

Example 2:

Find the shaded area:

2 mm

Q2:

Volume of rectangular solid:

Example 1:

Find the volume:

$\frac{14}{3}$ ft

$\frac{3}{2}$ ft

$\frac{24}{7}$ ft

Example 2:

On Southwest Airlines, the maximum size of a carry-on bag is a length of 24 inches, a width of 10 inches and a height of 16 inches. How much is packed in this maximum sized bag?
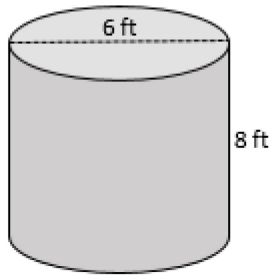
Q1:

Q2:

Volume of a cylinder:

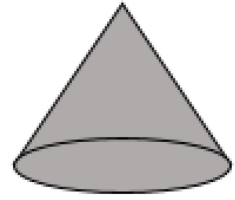
Example 1:

Find the volume:

6 ft

8 ft

Q1:

Example 2:

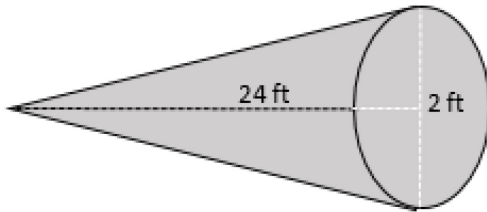A can of soda is about 5 inches tall with a diameter of 2.5 inches. How much soda can fit into the can?

Q2:

Volume of a cone:

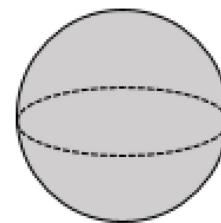**Example 1:**

Find the volume:

24 ft

2 ft

Q1:

Example 2:

How much ice cream can fit inside a cone that is 5 cm tall and 3 cm wide?

Q2:

Volume of a sphere:

Example 1:

Find the volume:

9 ft

Q1:

Example 2:

Find the volume of the "planet" Pluto if the radius is approximately 1195 km.

Q2:

If we do not have a formula for a shape, we must _____.

Example 1:

Find the volume

Q1:

Formulas to convert temperature:

$C =$ $F =$

Example 1:

98.6° F is body temperature. Find body temperature in degrees Celsius.

Q1:

Example 2:

100° C is the boiling point of water. Find at what temperature water boils in degrees Fahrenheit.

Q2:

You have completed the videos for 5.2 Area, Volume, and Temperature. On your own paper, complete the homework assignment.

Square root asks the question what number _____ is the inside number?

$\sqrt{25} =$

On calculator use the _____ button (may have to use the _____ or _____ button first)
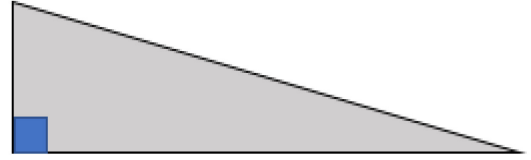

Example 1:

$$\sqrt{225}$$

Example 2:

$$\sqrt{456}$$

Q1:

Q2:

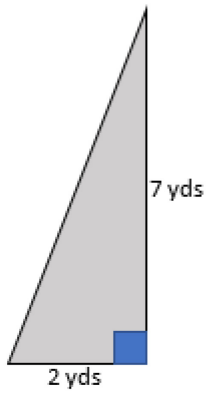Name the sides of the right triangle:

Pythagorean Theorem:

C is always the _____.

When finding a leg with the Pythagorean theorem, first _____ then _____.
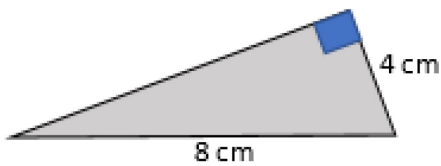

Example 1:

Find the missing side:

7 yds

2 yds

Q1:

Example 2:

Find the missing side:

4 cm

8 cm

Q2:

With applications it is always helpful to _____.

Example 1:

The base of a ladder is four feet from a building. The top of the ladder is eight feet up the building. How long is the ladder?

Q1:

Example 2:

A young boy is flying a kite. He let out 21 meters of string until the kite was flying over the head of his sister who was 9 meters away. How high is the kite?

Q2:

🛑 **You have completed the videos for 5.3 Pythagorean Theorem. On your own paper, complete the homework assignment.**

Term:

Monomial:

Binomial:

Trinomial:

Polynomial:

Adding Polynomials: _____ the _____ .

Example 1:

$$\left(4x^3 - 2x^2 + x\right) + \left(-3x^2 - 5x + 7\right)$$

Q1:

Example 2:

$$\left(3ab^3 - 2a^2b + ab\right) + \left(4a^2b - 2ab^3 + 4ab\right)$$

Q2:

First _____ the _____ .

Then _____ .

Example 1:

$$\left(3x^2 - 7x + 8\right) - \left(2x^2 + 9x - 4\right)$$

Q1:

Example 2:

$$\left(2x - 8y + 6\right) - \left(-3y - 7 + 5x\right)$$

Q2:

Consider $a^3 \square a^2 =$

When multiplying variables, we _____ the exponents.

If there is no exponent, then we assume the exponent is a _____.

Example 1:

$$\left(4x^3y^2z\right)\left(2x^7yz^4\right)$$

Q1:

Example 2:

$$-7a^3b^2c^4 \square 2ab^8c^4$$

Q2:

Consider: $5(3x-6)=$

When multiplying a monomial by a polynomial we _____.

Example 1:

$$5x^3\left(3x^2-4x+2\right)$$

Q1:

Example 2:

$$-2a^3b\left(5ab^4-6a^2b^7+2a^4\right)$$

Q2:

🛑 **You have completed the videos for 5.4 Introduction to Polynomials. On your own paper, complete the homework assignment.**

5.5 Scientific Notation
5.5a Convert Scientific Notation to Standard Notation

Scientific Notation: $a \times 10^b$

a is greater than or equal to _____ but less than _____. This means the decimal is always after the _____ digit.

b tells us how many times to _____ the decimal.

If b is negative, then standard notation is _____. If b is positive, then standard notation is _____.

Example 1:

Convert to standard notation:
$$4.21 \times 10^5$$

Q1:

Example 2:

Convert to standard notation:
$$6.2 \times 10^{-3}$$

Q2:

5.5b Convert Standard Notation to Scientific Notation

To convert to scientific notation _____ the number of times the _____ must move.

If standard notation is small, then the exponent is _____ if it is big then the exponent is _____ .

When converting we will _____ the extra _____ .

Example 1:

Convert to scientific notation:
48,100,000,000

Q1:

Example 2:

Convert to scientific notation
0.0000235

Q2:

STOP **You have completed the videos for 5.5 Scientific Notation. On your own paper, complete the homework assignment.**

STOP **Congratulations! You made it through the material for Unit 5: Geometry and Intro to Polynomials. It is time to prepare for your exam. On a separate sheet of paper, complete the review/practice test. Once you have completed the review/practice test, ask your instructor to take the test. Good luck!**

Unit 6:
Proficiency Exam #1

To work through this unit, you should:

1. Complete the review/practice tests on your own paper.

   NOTE: There are three parts to the review/practice test – Part A, B, and C.

2. Take the (three part) unit exam.

Conversion Factors

LENGTH

English	Metric (meter)
12 in = 1 ft 3 ft = 1 yd 1 mi = 5280 ft	1000 mm = 1 m 100 cm = 1 m 10 dm = 1 m 1 dam = 10 m 1 hm = 100 m 1 km = 1000 m

English to Metric

1 in = 2.54 cm

VOLUME

English	Metric (liter)
8 fl oz = 1 cup (c) 2 cups (c) = 1 pint (pt) 2 pints (pt) = 1 quart (qt) 4 quarts (qt) = 1 gallon (gal)	1000 mL = 1 L 100 cL = 1 L 10 dL = 1 L 1 daL = 10 L 1 hL = 100 L 1 kL = 1000 L 1 mL = 1 cc = 1 cm^3

English to Metric

1 gallon (gal) = 3.79 liter (L)

$1 in^3$ = 16.39 mL

WEIGHT (MASS)

English	Metric (gram)
16 oz = 1 pound (lb) 2,000 lb = 1 Ton (T)	1000 mg = 1 g 100 cg = 1 g 10 dg = 1 g 1 dag = 10 g 1 hg = 100 g 1 kg = 1000 g

English to Metric

2.20 lb = 1 kg

TEMPERATURE

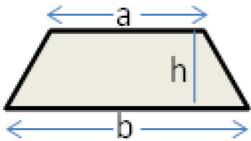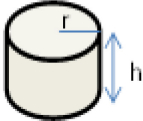$$C = \frac{5(F-32)}{9}$$

$$F = \frac{9}{5}C + 32$$

TIME

60 seconds (sec) = 1 minute (min)
60 minutes (min) = 1 hour (hr)
24 hours (hr) = 1 day
52 weeks = 1 year
365 days = 1 year

INTEREST

Simple: $I = Prt$

Continuous: $A = Pe^{rt}$

Compound: $A = P\left(1 + \frac{r}{n}\right)^{nt}$

Annual: n=1
Semiannual: n=2
Quarterly: n=4

Geometric Formulas

Name	Diagram	Area
Rectangle	w ▭ l	$A = lw$ $P = 2l + 2w$
Parallelogram	h, b	$A = bh$
Triangle	h, b	$A = \dfrac{1}{2}bh$
Trapezoid	a, h, b	$A = \dfrac{1}{2}h(a+b)$
Circle	d, r	$A = \pi r^2$ $C = \pi d = 2\pi r$

Name	Diagram	Volume
Rectangular Solid	h, w, l	$V = lwh$
Right Circular Cylinder	r, h	$V = \pi r^2 h$
Right Circular Cone	h, r	$V = \dfrac{1}{3}\pi r^2 h$
Sphere	r	$V = \dfrac{4}{3}\pi r^3$

Right Triangle		

Pythagorean Theorem: $a^2 + b^2 = c^2$

a, c, b