REVIEW OF BASIC MATHEMATICAL RULES

Rules for Signed Numbers

Addition Rules:

positive + positive = (add) positive   Ex: $2 + 1 = 3$

negative + negative = (add) negative   Ex: $-3 + (-5) = -8$

negative + positive = (subtract) and   Ex: $2 + (-10) = -8$
take sign of number with largest   Ex: $-14 + 16 = 2$
absolute value

Remember: $-(-7)$ means **take the opposite of** $(-7) = 7$

Subtraction Rules: Change all "subtraction" to addition and take the opposite sign of the following number then follow the addition rules.

Ex: $-7 - (9)$ means   Ex: $-3 - (-10)$ means

$\quad -7 + (-9) = -16$ $\quad -3 + (10) = 7$

Ex: $-8 + (-9) \underline{- (-1)} - 2$ -change all subtraction signs as indicated above

$\quad \underline{-8 + (-9)} + (1) + (-2)$ -do addition and subtraction from left to right

$\quad \underline{-17 \;+\; (1)} + (-2)$

$\quad \quad -16 \;\; + (-2) = -18$

Multiplication/Division Rules: *The rules for multiplication and division are the same.*

positive (× or ÷) positive = positive   Ex: $10 \div 2 = 5$

negative (× or ÷) negative = positive   Ex: $-4 \times (-3) = 12$

negative (× or ÷) positive = negative   Ex: $18 \div (-2) = -9$

Order of Operations:

Parenthesis;
Exponents;
Multiplication **or** Division from **left to right**;
Addition **or** Subtraction from **left to right**

P.E.M.D.A.S.

Ex: $-7 + 20 \div (-4)(5) - 3^2 - (-8) + 4\underline{(3 - 7)}$	1. Parenthesis
$-7 + 20 \div (-4)(5) - \underline{3^2} - (-8) + 4(-4)$	2. Exponents
$-7 + \underline{20 \div (-4)}(5) - 9 - (-8) + 4$	3. Division
$-7 + \underline{(-5) \quad (5)} - 9 - (-8) + 4$	4. Multiplication
$\underline{-7 + \quad (-25)} - 9 - (-8) + 4$	5. Addition
$-32 \qquad - 9 - (-8) + 4$	6. Change subtraction signs
$\underline{-32 \quad + \quad (-9)} + (8) + 4$	
$\underline{-41 \qquad + 8} + 4$	
$-33 \qquad + 4 = -29$	

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Percent Equation:

<u>What percent</u> of the <u>total</u> is the <u>part</u>?
$$\% \quad \times \quad T \quad = \quad P$$

12% of the 200 students enrolled in freshman English earned a grade of "A" in the class. How many students earned an "A"?

Ex: 12% of 200 is what	- Translate into an equation
	("of" means "multiply"; "is" means "equal")
$0.12 \times 20 = x$	- Change % to a decimal
$24 = x$	

MATH 1000

Percent Decrease/Increase:

Last year student employment jobs paid $7.25 per hour. This year student employment jobs are paying $8.45 per hour. What percent increase was given to student employment jobs?

1. Find the amount of the **increase**: $8.45 - $7.25 = **$1.20**

2. Which (hourly pay) **total** received an increase? The **$7.25** per hour got increased.

3. What % of the total was the increase?

$$x \bullet 7.25 = 1.20$$

$$7.25x = 1.20$$

$$\frac{7.25}{7.25}x = \frac{1.20}{7.25}$$

$$x = .1655$$

$$x = 16.6\% \text{ increase}$$

Place Value:

$10^1 = 10$	$10^{-1} = 0.1$
$10^2 = 100$	$10^{-2} = 0.01$
$10^3 = 1000$	$10^{-3} = 0.001$
$10^4 = 10000$	$10^{-4} = 0.0001$

Angles:

Acute Angles:	**less than 90 degrees**
Obtuse Angles:	**more than 90 degrees**
Right Angles:	**90 degrees**
Straight Angle:	**180 degrees**

Complementary Angles: Two angles the sum of whose measures is **90 degrees**

Supplementary Angles: Two angles the sum of whose measures is **180 degrees**

Triangles:

Triangles:	Sum of the interior angles is **180 degrees**
Isosceles Triangle:	Two equal sides; two equal angles
Equilateral Triangle:	Three equal sides; three equal angles

Right Triangles - Pythagorean Theorem: $a^2 + b^2 = c^2$, where a and b are the measures of the legs of the triangle and c is the hypotenuse.

Statistics:

Mean (average) =	sum of all values divided by number of values
Median =	**middle** value when the values are arranged numerically
Mode =	the data value **that occurs most frequently**

Probability: $P(A) = \dfrac{the\ frequency\ of\ A}{total\ sample\ size}$