

Tutoring and Testing Center

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 take sign of number with largest Ex: 2 + (-10) = -8 Ex: -14 + 16 = 2

absolute value

Remember: -(-7) means <u>take the opposite of</u> (-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

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

Ex: -8 + (-9) - (-1) - 2 -change all subtraction signs as indicated above

-8 + (-9) + (1) + (-2) -do addition and subtraction from left to right

$$-17 + (1) + (-2)$$

$$-16 + (-2) = -18$$

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

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

negative (\times or \div) negative = positive **Ex:** $-4 \times (-3) = 12$

negative (\times or \div) 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:
$$-7 + 20 \div (-4)(5) - 3^2 - (-8) + 4(3 - 7)$$

 $-7 + 20 \div (-4)(5) - 3^2 - (-8) + 4(-4)$
 $-7 + 20 \div (-4)(5) - 9 - (-8) + 4$
 $-7 + (-5) (5) - 9 - (-8) + 4$
 $-7 + (-25) - 9 - (-8) + 4$
 $-32 - 9 - (-8) + 4$
 $-32 + (-9) + (8) + 4$
 $-41 + 8 + 4$
 $-33 + 4 = -29$

- 1. Parenthesis
- 2. Exponents
- 3. Division
- 4. Multiplication
- 5. Addition
- 6. Change subtraction signs

Percent Equation:

$$\frac{}{\%} \times T = P$$

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

- Translate into an equation

 $0.12 \times 20 = x$

("of" means "multiply"; "is" means "equal")

- Change % to a decimal

$$24 = x$$

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% increase

Place Value:

$$10^1 = 10 10^{-1} = 0.1$$

$$10^{-1} = 0.1$$

$$10^2 = 100$$

$$10^2 = 100 10^{-2} = 0.01$$

$$10^3 = 1000$$

$$10^3 = 1000 10^{-3} = 0.001$$

$$10^4 = 10000$$

$$10^4 = 10000$$
 $10^{-4} = 0.0001$

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.

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