Name: Due Date:

Unit 0: Math Skills - Things To Memorize

1. Scientific Notation:

   - Scientific Notation always has three parts: the *coefficient*, the *base*, and the *exponent*:

   $$\text{Coefficient} \rightarrow 6.022 \times 10^{23} \leftarrow \text{Exponent}$$
   $$\uparrow$$
   $$\text{Base}$$

   - In scientific notation the base is always 10.
   - A negative in front of the coefficient means the whole number is negative.
   - A negative exponent means the number is very small (close to zero).
   - The exponent counts how many places the decimal moved, NOT the number of zeroes.
   - When comparing numbers in scientific notation, look at (in order):
     (a) Negatives in front of the coefficient.
     (b) Exponents
     (c) Coefficients
   - To multiply, multiply coeffients, then ADD exponents.
   - To divide, divide coefficients, then SUBTRACT exponents.
   - To raise to a power, raise the coefficient to the power, then MULTIPLY exponents.
   - To enter scientific notation on the calculator use the "EE" key. 6.022×10^{23} is entered as 6.022E23. Calculator notation should never be handwritten.

2. Algebra:

   - To solve for something in the top of a fraction, multiply by the bottom.

   $$A = \frac{B}{C} \quad \longrightarrow \quad A \times C = \frac{B}{\cancel{C}} \times \cancel{C} \quad \longrightarrow \quad AC = B$$

   - To solve for something in the bottom of a fraction, switch the bottom with the other side:

   $$A = \frac{B}{C} \rightarrow C = \frac{B}{A}$$

3. Trigonometry

   - Remember: SOH-CAH-TOA. It means:

     $$\sin(\theta) = \frac{opp}{hyp} \qquad \cos(\theta) = \frac{adj}{hyp} \qquad \tan(\theta) = \frac{opp}{adj}$$

   - Hypotenuse is always the longest side.
   - Cut the angle of interest in half and draw a line across the triangle to find the opposite side.
   - The adjacent side and the hypotenuse create the angle.
   - To find a side, use regular functions (sin, cos, tan)
   - To find an angle use inverse functions (called arcsin, arccos arctan or $\sin^{-1}$ $\cos^{-1}$ $\tan^{-1}$)
   - All trigonometric functions need an argument - They never go anywhere without (θ).

4. Arc Length

   - 2π radians = 360° = 1 full rotation
   - 1 radian is the angle where the radius = the arc length $\approx 57.2958^\circ$
   - To use the arc-length formula, all angles must be measured in radians.