Preparing for Trig Test One

Very Important Ideas

- **Importance of Trigonometry**
  What is trigonometry? Why is it useful?

- **Relationship between Radian Measure and Degree Measure**
  π radians $= 180°$

- **Arc Length, Angular Speed (Velocity, Frequency) and how they are Related to Linear Length, Speed**
  $l = r\theta$ ($C = 2\pi r$ is a special case)

  linear speed = $v = \frac{d}{t} = \frac{r\theta}{t} = \frac{r}{1}\left(\frac{\theta}{t}\right) = r\omega = (\text{radius})(\text{angular speed})$

  angular speed = $\omega = \frac{\theta}{t} = \frac{\theta}{t}\left(\frac{r}{r}\right) = \frac{\theta r}{t}\left(\frac{1}{r}\right) = \frac{d}{t}\left(\frac{1}{r}\right) = v\left(\frac{1}{r}\right) = \frac{v}{r} = \frac{\text{linear speed}}{\text{radius}}$

- **Trigonometric Relationships in Right Triangles**
  Special Triangles are Very Important!

- **Trigonometric Relationships in all Triangles**

- **Extending Trigonometric Ratios to all of $\mathbb{R}$: Angles of Rotation**
  Initial Arm, Terminal Arm, Definitions of Ratios in terms of *x*, *y* and *r*, Standard Position, Coterminal Angles, Principal Angle, Related First Quadrant (Acute) Angle (aka "Reference Angle"), Signs of ratios in each quadrant are determined by signs of *x* and *y* (*r* is always positive), Unit Circle

- **Graphs of Trigonometric Functions**
  Use your knowledge of transformations to understand the meanings of *A*, *d*, ω, *p*, *T*
  Apply transformations to key points on graph of base function
  Understand the correspondence between quadrants and graphs
  Sinusoidal Functions and their Reciprocals: Each quadrant corresponds to a quarter-cycle of the graph
  Tangent and Cotangent: Each quadrant corresponds to a half-cycle of the graph

- **Using Sinusoidal Functions to Model Periodic Phenomena**
  Properties of Periodic Functions
  Understanding relationship between *A*, *d*, ω, *p*, *T* and properties of the phenomena
  (e.g. Ferris Wheel: *A* = radius, *d* = average height above the ground, *d* + *A*= maximum height above ground, *d* – *A* = minimum height above ground, *T* = time to complete one rotation, ω = rate of rotation in rad/unit of time)
  There are infinitely many correct equations for each sinusoidal function (due to periodic nature)
  Again, make use of your knowledge of transformations!

Test-Writing Strategies

- Take a few minutes to carefully read ALL the questions. While reading, highlight important information
- Answer the questions in order from least challenging to most challenging.
- Manage your time according to the number of marks allotted per question.
- Don't get obsessed with any question. If you're stuck, move on!
- DO NOT show every step of long, tedious calculations! Use a calculator for this! I mark reasoning and how well it's communicated. I don't assign marks for arithmetic.
- DO explain your reasoning for steps or statements that are not self-explanatory. DON'T write essays!