Final Exam Material and Expectations

For the final exam, you should be able to do the following things:

Chapter 7.

- Draw an angle in standard position
- Given an angle in radians, convert to degrees
- Given an angle in degrees, convert to radians
- Find angles/arcs coterminal to a given angle/arc
- Find the reference angle/arc of a given angle/arc
- Find values of the six trigonometric functions of a number using the terminal point on the unit circle
- Find the sign of a trig function based on the quadrant of the terminal point/terminal side
- Remember the values of sin, cos, and tan for the angles $\frac{\pi}{6}$, $\frac{\pi}{4}$, and $\frac{\pi}{3}$
- Given two sides of a right triangle, use the Pythagorean Theorem to find the third side
- Given two sides of a right triangle, compute the six trigonometric ratios of one of the acute angles, and use inverse trig functions to compute the measure of the angle
- Given one side and an acute angle of a right triangle, use the trig ratios to find the other sides
- Use the formulas for Length of a Circular Arc, Area of a Sector, and Linear Speed and Angular Speed

Chapter 8.

- Find the period and amplitude of a transformation of a trig function
- Sketch the graphs of the sine and cosine functions, including changes in amplitude or period
- Identify graphs of all six trigonometric functions
- Find domain and range of the inverse sine, cosine, and tangent functions
- Given two sides of a right triangle, compute the six trigonometric ratios of one of the acute angles, and use inverse trig functions to compute the measure of the angle
- Simplify expressions involving compositions of trig functions and inverse trig functions
- Use the Law of Sines or Law of Cosines to solve oblique triangles (technically Sections 10.1 and 10.2)
- Compute the area of a triangle (technically Sections 10.1 and 10.2)

Chapter 9.

- Solve basic trigonometric equations
- Use algebra and factoring to solve more complicated trigonometric equations
- Remember the Pythagorean trig identities and the reciprocal trig identities
- Verify other trig identities, using the Pythagorean and reciprocal trig identities, algebraic manipulations, and the other fundamental trig identities from Sections 9.2, 9.3 and 9.4
- Use the fundamental trig identities and factoring to solve more complicated trigonometric equations

Chapter 10.

- Plot a point in polar coordinates
- Given a point in polar coordinates, convert to rectangular coordinates
- Given a point in rectangular coordinates, convert to polar coordinates
- Given an equation in polar coordinates, convert the entire equation to rectangular coordinates
- Given a complex number, write in polar form by finding the modulus and argument
- Using the polar form of complex numbers, compute products, quotients, and powers of complex numbers
- Draw a vector with initial point at the origin
- Given a vector in component form, express in terms of **i** and **j**
- Given a vector, compute its magnitude and direction
- Given the magnitude and direction of a vector, compute its horizontal and vertical components and express the vector in component form or in terms of **i** and **j**
- Add vectors and multiply a vector by a scalar
- Compute the dot product of two vectors
- Use the dot product to compute the angle between two vectors
- Use the dot product to determine if two vectors are orthogonal
- Given two vectors **u** and **v**, calculate the component of **u** along **v**
- Given two vectors **u** and **v**, calculate the projection of **u** onto **v**

Chapter 12.

- Given the focus of a parabola with vertex at the origin, write an equation for the parabola
- Given the equation for a parabola with vertex at the origin, find the focus and directrix
- Given the foci and vertices of an ellipse centered at the origin, write an equation for the ellipse
- Given the equation for an ellipse centered at the origin, find the foci, vertices, and lengths of major and minor axes
- Given the foci and vertices of a hyperbola centered at the origin, write an equation for the hyperbola
- Given the equation for a hyperbola centered at the origin, find the foci, vertices, and asymptotes

Possible Word Problem Material.

- Use trig ratios to find lengths and distances
- Use inverse trig functions to find angles of elevation
- Use the Law of Sines or Law of Cosines to find lengths and distances
- Use the dot product to calculate the work done by a force over a distance