

## FINAL EXAM MATERIAL AND EXPECTATIONS

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

### Chapter 5.

- Draw an angle in standard position
- Given an angle in radians, convert to degrees
- Given an angle in degrees, convert to radians
- Find angles coterminal to a given angle
- Find the reference angle of a given angle
- 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
- Find the sign of a trig function based on the quadrant
- Use the Law of Sines or Law of Cosines to solve oblique triangles
- Compute the area of a triangle
- Use the formulas for Length of a Circular Arc, Area of a Sector, and Linear Speed and Angular Speed

### Chapter 6.

- Find the period and amplitude of a transformation of a sine or cosine function
- Sketch the graphs of the sine and cosine functions
- Identify graphs of all six trigonometric functions
- Find domain and range of the inverse sine, cosine, and tangent functions
- Identify graphs of these inverse trig functions
- Simplify expressions involving compositions of trig functions and inverse trig functions

### Chapter 7.

- Remember the Pythagorean trig identities and the reciprocal trig identities
- Use the other fundamental trig identities (from the sheet given on exams 2 and 3) to verify other trig identities
- Solve basic trigonometric equations
- Use the fundamental trig identities and factoring to solve more complicated trigonometric equations

### Chapter 8.

- 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
- Using the polar form of complex numbers, compute products, quotients, and powers of complex numbers

**Chapter 9.**

- Draw a vector with initial point at the origin
- Given a vector in component form, express in terms of  $\mathbf{i}$  and  $\mathbf{j}$
- 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  $\mathbf{i}$  and  $\mathbf{j}$
- 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  $\mathbf{u}$  and  $\mathbf{v}$ , calculate the component of  $\mathbf{u}$  along  $\mathbf{v}$
- Given two vectors  $\mathbf{u}$  and  $\mathbf{v}$ , calculate the projection of  $\mathbf{u}$  onto  $\mathbf{v}$

**Possible Word Problem Material.**

- Use trig ratios to find lengths and distances, as in the word problems from 6.2
- Use inverse trig functions to find angles of elevation, as in the word problems from 6.4
- Use the Law of Sines or Law of Cosines to find lengths and distances, as in the word problems from 6.5 and 6.6
- Add vectors to get true velocity and true speed, as in the word problems from 10.1
- Use the dot product to calculate the work done by a force over a distance, as in the word problems from 10.2