Review Sheet for Final Exam (Chapters 4, 5, and 6, and Section 10.7)
Math 1060-1

Formulas Given:

$$\sin(u+v) = \sin u \cos v + \cos u \sin v \qquad \sin\frac{u}{2} = \pm\sqrt{\frac{1-\cos u}{2}}$$

$$\cos(u+v) = \cos u \cos v - \sin u \sin v \qquad \cos\frac{u}{2} = \pm\sqrt{\frac{1+\cos u}{2}}$$

$$\tan(u+v) = \frac{\tan u + \tan v}{1 - \tan u \tan v} \qquad \tan\frac{u}{2} = \frac{1-\cos u}{\sin u}$$

$$c^2 = a^2 + b^2 - 2ab\cos C \qquad \cos\theta = \frac{\mathbf{u}\cdot\mathbf{v}}{\|\mathbf{u}\|\cdot\|\mathbf{v}\|}$$

$$\text{Area} = \frac{1}{2}ab\sin C \qquad z^n = r^n(\cos n\theta + i\sin n\theta)$$

Section 4.1

- Know how to convert between degrees and radians.

- Be able to sketch angles in standard position and determine in which quadrant the angle lies.

- Be able to find coterminal angles.

- Be able to find complementary and supplementary angles for a given angle.

- **Practice Problems:** 4.1 #7, 13, 19, 21, 47, 51

Section 4.2

- Given a point on the unit circle, be able to find all six trigonometric functions.

- Be able to find the point (x, y) on the unit circle that corresponds to common angles $(\theta = 0, \pi/6, \pi/4, \pi/3, \pi/2, \text{etc.})$

- Know which trigonometric functions are odd and which are even, and be able to use this to help evaluate trigonometric functions.

- Be able to use the period of trigonometric functions to help calculate trigonometric functions.

- **Practice Problems:** 4.2 #1, 7, 23, 29, 37

Section 4.3

- Given a right triangle, be able to find all six trigonometric functions.

- Know the Pythagorean identities.

- **Practice Problems:** 4.3 #1, 9, 17, 27, 29, 33, 37

Section 4.4

- Know how to calculate reference angles, and use them to evaluate trigonometric functions.

- Given the value of one trigonometric function and a constraint, be able to calculate the remaining trigonometric functions.

- **Practice Problems:** 4.4 #15, 19, 29, 41, 51, 53, 55

Section 4.5

- Know how to calculate the amplitude and period of sine and cosine functions.

- Be able to sketch the graph of sine and cosine functions, using the amplitude, period, and translations.

- **Practice Problems:** 4.5 #35, 37, 51, 53, 55

Section 4.6

- Be able to sketch the graphs of tangent, cosecant, secant, and cotangent functions, including information on the period and vertical asymptotes.

- **Practice Problems:** 4.6 #7, 11, 13, 19, 29

Section 4.7

- Know how to calculate inverse sine, inverse cosine, and inverse tangent functions, and be aware of their domains and ranges.

- Be able to evaluate the composition of trigonometric and inverse trigonometric functions.

- **Practice Problems:** 4.7 #1, 5, 7, 43-57 odds

Section 4.8

- Know how to apply trigonometric functions (and right triangles) to word problems.

- **Practice Problems:** 4.8 #15, 17, 21, 27, 37

Section 5.1

- Be able to use trigonometric identities to simplify expressions.

- **Practice Problems:** 5.1 #1, 3, 5, 27-43 odds

Section 5.2

- Be able to verify trigonometric identities.

- **Practice Problems:** 5.2 #1-37 odds

Section 5.3

- Know how to solve trigonometric equations.

- **Practice Problems:** 5.3 #7-33 odds

Section 5.4

- Know how to use the sum and difference formulas for the sine, cosine, and tangent functions.

- **Practice Problems:** 5.4 #1-21 odds, 37-49 odds

Section 5.5

- Be able to use double-angle formulas.

- Know how to use the half-angle formulas, including whether the resulting value is positive or negative.

- **Practice Problems:** 5.5 #23, 25, 27, 49, 51, 53

Section 6.1

- Know and be able to use the Law of Sines to solve a triangle.

- Be able to find the area of a triangle.

- **Practice Problems:** 6.1 #1, 3, 5, 13, 29, 31, 33, 43

Section 6.2

- Know how to use the Law of Cosines to solve a triangle.

- **Practice Problems:** 6.2 #1-9 odds, 15

Section 6.3

- Be able to find the component form and magnitude of a vector.

- Know how to sketch vectors on the coordinate plane.

- Be able to find a unit vector in the direction of a given vector.

- Be able to add and subtract vectors, as well as multiply them by scalars.

- Know how to use the standard unit vectors **i** and **j**.

- Know how to find the direction angle of a vector.

- **Practice Problems:** 6.3 #3-13 odds, 21-37 odds, 53, 55

Section 6.4

- Know how to calculate the dot product of two vectors.

- Be able to find the angle between two vectors, and be able to tell when two vectors are parallel, orthogonal, or neither.

- **Practice Problems:** 6.4 #1-37 odds

Section 6.5

- Know how to plot complex numbers on the coordinate plane.

- Be able to write complex numbers in trigonometric form.

- Given the trigonometric form of two numbers, be able to multiply and divide them.

- Be able to use DeMoivre's Theorem to find powers of complex numbers.

- **Practice Problems:** 6.5 #11-39 odds, 47-57 odds, 71-87 odds

Section 10.7

- Be able to plot points given with polar coordinates.

- Know how to convert between rectangular and polar coordinates.

- Be able to convert between rectangular and polar equations.

- Be able to sketch the graph of basic polar equations.

- **Practice Problems:** 10.7 #1-25 odds, 33-69 odds