MATH 1112: Trigonometry

Trigonometry starts on Chapter 7 as it is the 2nd half of MATH 1113, Precalculus.
Bullet points without links are works-in-progress.

Chapter 7: The Unit Circle: Sine and Cosine Functions

7.1 ANGLES

- Draw angles in standard position
- Introduction to radians
- Radians and Quadrants
- Converting between radians and degrees (introduction)
- Converting degrees to radians
- Add angles in DMS form
- Subtract angles in DMS form
- Find coterminal Angles using degrees (example 1 and 2)
- Find coterminal angles using radians
- Length of an arc that subtends a central angle
- Area of a sector given a central angle

7.2 RIGHT TRIANGLE TRIGONOMETRY

- SOHCAHTOA – Part 1 (Introduction), Part 2 (More examples)
- Solve for a side in a right triangle
- Basic cofunction identities
- The Trigonometric Pythagorean Identity (derivation)
- Finding the six trigonometric functions of an angle in a right triangle
- Application (Find the height of a tree)
- Application (A ladder problem)

7.3 UNIT CIRCLE

- Introduction to the unit circle
- Trigonometric values of 45 degree angles
- Use the trigonometric Pythagorean identity
- Find reference angles using degrees
- Find reference angles using radians

- Use reference angles to evaluate sine, cosine and tangent

7.4 THE OTHER TRIGONOMETRIC FUNCTIONS

- Recognize and use fundamental identities
- Even-odd properties of trigonometric functions
- Use reference angles to evaluate secant and cosecant

Chapter 8: Periodic Functions

8.1 GRAPHS OF THE SINE AND COSINE FUNCTIONS

- Graph of sine function
- Find the amplitude and period
- Find the amplitude, period (plus graphing)
- Graph basic sinusoidal functions without translations
- Graph a sinusoidal function

8.2 GRAPHS OF THE OTHER TRIGONOMETRIC FUNCTIONS

- Analyze the graph of y=tan(x)
- Graph a tangent function
- Analyze the graphs of y=csc(x) and y=sec(x)
- Graph a secant function
- Graph a cosecant function
- Graph a cotangent function

8.3 INVERSE TRIGONOMETRIC FUNCTIONS

- Introduction to inverse trigonometric functions
- Evaluate inverse trigonometric functions
- Example of solving a right triangle given one side and an angle
- Example of solving a right triangle given two sides
- Find exact values of composite functions with inverse trig functions

- More examples of finding exact values of composite functions with inverse trig functions

Chapter 9

9.1 SOLVING TRIGONOMETRIC EQUATIONS WITH IDENTITIES

- Simplifying trigonometric expressions

9.2 SUM AND DIFFERENCE IDENTITIES

- Use the sum and difference formulas for cosine, sine and tangent

9.3 DOUBLE-ANGLE, HALF-ANGLE, AND REDUCTION FORMULAS

- Use the half-angle formulas
- Use double angle formulas
- Use reduction formulas

9.4 SUM-TO-PRODUCT AND PRODUCT-TO-SUM IDENTITIES

- Express products as sums and sums as products

9.5 SOLVING TRIGONOMETRIC EQUATIONS

- Solving trigonometric equation using identities and factoring
- Solve a trigonometric equation in sine or cosine
- Solve a trigonometric equation in tangent

Chapter 10

10.1 NON-RIGHT TRIANGLES: LAW OF SINES

- Use Law of Sines to solve for a side or an angle
- Find the area of an oblique triangle using the sine function

10.2 NON-RIGHT TRIANGLES: LAW OF COSINES

- Use Law of Cosines to solve for a side or an angle
- Use Heron's formula to find the area of a triangle

10.3 POLAR COORDINATES

- Plotting polar coordinates and converting between polar and rectangular coordinates

10.5 POLAR FORM OF COMPLEX NUMBERS

- Plot complex numbers in the complex plane
- Find the absolute value of a complex number
- Write complex numbers in polar form
- Find product and quotient of complex numbers in polar form
- Finding powers of complex numbers in polar form
- Finding roots of complex numbers in polar form

10.8 VECTORS

- View vectors geometrically and algebraically
- Find magnitude and direction of a vector
- Find vector addition, scalar multiplication and dot product
- Find the unit vector in the direction of a given vector