Section 6.2
Right Triangle Trigonometry

Goals:

- Learn basic concepts about trigonometric functions
- Apply right triangle trigonometry
- Understand complementary angles and cofunctions

Vocabulary to learn:
As you read this section in your textbook, write in a definition for each of these terms. It may also help you to draw a picture to illustrate some of the terms. Make sure you understand the meaning of each word well enough to explain it clearly to someone else and to understand how to use it in an example or homework problem.

- Standard labeling of triangles
- Similar triangles
- Sine function
- Cosine function
- Tangent function
- Cosecant function
- Secant function
- Cotangent function
- Angle of elevation
- Angle of depression
- Solving a triangle
- Reciprocal identities
- Cofunction

Summary:
This section introduces you to the six trigonometric functions as they are defined using a right triangle. You will learn how to find exact values of the functions, and when that is possible. You will learn how to find approximate values of the functions for cases when it is not possible to get exact answers. You will learn how to use the trigonometric functions to solve for unknown sides of a right triangle. You will solve application problems involving right triangles and the trigonometric functions. You will finish by learning the cofunction formulas and how they can be used.
Formulas/Procedures:

$$\sin \theta = \frac{\text{opposite side}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite side}}{\text{adjacent side}}$$

$$\csc \theta = \frac{\text{hypotenuse}}{\text{opposite side}}$$

$$\sec \theta = \frac{\text{hypotenuse}}{\text{adjacent side}}$$

$$\cot \theta = \frac{\text{adjacent side}}{\text{opposite side}}$$

Solving Triangles:

1) Check to see which side of the right triangle is known. (opposite, adjacent, or hypotenuse?)

2) Check to see which unknown side of the triangle you need to find first. (opposite, adjacent, or hypotenuse?)

3) At this point you will have two side labels written down. Choose the trigonometric function whose formula above involves those two sides. Note that you always have two options of functions to choose from.

4) Write an equation using the formula you chose in step 3. Fill in the known side and angle measurements and choose a variable to represent the unknown side length.

5) Use algebra to solve the equation you wrote in step 4. Write your answer in exact form. You can also find the approximate value using your calculator if the problem calls for that.

$$\sin \theta = \cos(90^\circ - \theta)$$

$$\cos \theta = \sin(90^\circ - \theta)$$

$$\tan \theta = \cot(90^\circ - \theta)$$

$$\cot \theta = \tan(90^\circ - \theta)$$

$$\sec \theta = \csc(90^\circ - \theta)$$

$$\csc \theta = \sec(90^\circ - \theta)$$

$$\theta$$