M$6 Exam 5 is on Wednesday, May 27, 2009

Topics:

- Solving equations involving trig functions of a double angle
- Law of cosines
- Area of a triangle formula
- Law of sines
- Ambiguous case (determining the number of distinct triangles)
- Trig applications including force problems and "double-triangle" problems

Calculators are <u>required</u> for this exam.

$$c^2 = a^2 + b^2 - 2ab\cos C$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$K = \tfrac{1}{2}ab\sin C$$

$$\sin 2A = 2\sin A\cos A$$

$$\cos 2A = \cos^2 A - \sin^2 A$$

$$\cos 2A = 1 - 2\sin^2 A$$

$$\cos 2A = 2\cos^2 A - 1$$

M$6 Homework 52

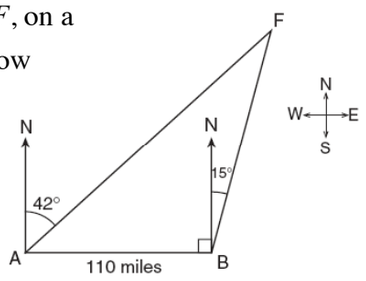
1. Find, to the nearest degree, all values of θ in the interval $0° \le \theta < 360°$ that satisfy the equation: $5\sin\theta + 2\cos 2\theta = 3$.

2. In $\triangle JKL$, $JL = 16$, $KL = 12$, and $\cos L = \frac{\sqrt{2}}{2}$. Find the area of $\triangle JKL$ to the *nearest tenth of a square unit*.

3. How many distinct triangles can be formed if $a = 20$, $b = 30$ and $m\angle A = 30$?

4. The members of the Delta Delta Delta Sorority want to take a picture of themselves standing in a triangle formation. They determined that the three sides of the triangle must measure 20 feet, 22 feet, and 24 feet. To the nearest hundredth of a degree, what is the measure of the smallest angle of the triangle?

5. As shown in the accompanying diagram, two tracking stations, *A* and *B*, are on an east-west line 110 miles apart. A forest fire is located at *F*, on a bearing 42° northeast of station *A* and 15° northeast of station *B*. How far, to the *nearest mile*, is the fire from station *A*?



6. A glass-walled skyscraper has an elevator that is visible from outside. John is standing on the sidewalk 100 feet from the base of the skyscraper when he sees that the elevator is stuck. The angle of elevation from John's location to the elevator is 43°. A few minutes later, the elevator begins to move down, but then it gets stuck again. Now, the angle of elevation is 36°. Find, to the *nearest tenth of a foot*, the distance that the elevator has moved.

7. Two forces are applied to an object. The measure of the angle between the 30.2-pound applied force and the 50.1-pound resultant is 25°.
   a Find the magnitude of the second applied force to the *nearest tenth of a pound*.
   b Find the measure of the angle between the second applied force and the resultant to the *nearest degree*.

8. Amina, a building contractor, needs to paint a triangular region 75 yards by 68 yards by 85 yards. Determine the area of the triangular region to the *nearest tenth of a square yard*.

   Each can of paint costs $15.25 and contains enough paint to cover 75 square yards of area. If Amina has $500, will she have enough money to purchase the number of cans of paint needed to paint the entire triangular region? Justify your response.