**6.2 Law of Cosines**

**Objective: Use law of cosines to solve (using SSS, SAS, SSA) and find area (Heron’s Area Formula) of oblique triangles while applying it to real life situations**

**Why can’t you use Law of Sines in these cases?!**

**Law of Cosines** (proof on page 488)

*Standard Form Alternative Form*

*Example 1:* Three sides of a triangle – SSS

For the triangle with a = 8 feet, b = 19 feet and c = 14 feet. Find the remaining sides and angles. *[Good idea to find angle opposite largest side 1st]*

*[If biggest angle is obtuse, others acute… if acute all acute]* ***Solution:***

*[Can use Law of Cosine to keep going, but perhaps easier to use Law of Sines now.]*

*Example 2:* Two Sides and the Included Angle – SAS

For the triangle with b = 9 feet, c = 12 feet and . Find the remaining sides and angles.

***Solution:***

*[Can use Law of Cosine to keep going, but perhaps easier to use Law of Sines now.]*

But, because side c is the longest side the C has to be the largest angle.

Therefore,

*Example 3:* Application of Law of Cosines

The pitcher’s mound in softball field is 43 feet from home plate and the distance from home plate and the distance between the bases is 60 feet. (Note pitcher’s mound is not halfway between home and 2nd base). How far is the pitcher’s mound from first base?

***Solution:***

*[Diagonal of a square, thus 45 degrees]*

**Heron’s Area Formula**

Given any triangle with sides a, b, and c, the area of the triangle is:

*Example 4:* Using Heron’s Formula

Find the area of a triangle with a = 43, b = 53, and c = 72

***Solution:***

**Homework**

Pg 441 #5, 7, 9, 13, 27, 29, 33, 43, 53