Index Card #19 (Back & Front)

Law of Sines and Cosines

**Law of Sines:** $\frac{Sin A}{a}=\frac{Sin B}{b}$ **Used: *You have* 2 Angles & a Side *Looking for* a Side**

 **OR *You have* 2 Sides & an Angle *Looking for* an Angle**

 **You have PAIRS**

**Law of Cosines:** $a^{2}=b^{2}+c^{2}-2bc Cos A$ **Used: *You have* 3 Sides *Looking for* an Angle**

 ***OR You have* 2 Sides & an Angle *Looking for* a Side**

**You will know All 3 Sides at the END**

**Area of a Triangle:** k =$ \frac{1}{2}ab sinC$

**Ambiguous Case - How many triangles are possible ?**

**Steps:**

**FIRST:** **Draw a Picture**

 b a

 A B

**SECOND:**  **Find your missing angle using Law of Sines**

**THIRD:**

Is Sin **** If yes: If NO: Step 4

 **0 Triangles**

**FOURTH:**

 **Remember:** $Sin θ$ **is Positive in Quadrants I and II**

**To find the 2nd possible angle….180-Angle gives you the 2nd Angle**

 **The angles of a Triangle sum to** $180°$

 so does the 2nd angle that you found go over $180°$ when you add it with the angle given???

 If yes: If NO: Step 5

  **1 Triangle**

 (If angle given is acute – Acute Triangle) (If angle given – Obtuse Triangle**)**

**FIFTH:**

The 2nd angle that you found does not go over $180°$ when you add it with the angle given

 If yes:

 **2 Triangles**

b a a (1 Acute 1 Obtuse Triangle)

 Now you have two triangles:

 A B’ B One with the first value of B found The second with 180 – B for the value of B