Precal Name:______________________

Notes (5.1)---Law of Sines

Objective: You will be able to understand the proof of the Law of Sines and will be able to use the formula to solve a variety of problems.

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The **Law of Sines** states the ratio of the sine of an angle to the length its opposite angle is the same for all three angles.

In any ΔABC with angles $A, B,$ and$C$ opposite sides $a, b,$ and, c respectively, the following equation is true:

$$\frac{\sin A}{a} = \frac{sinB}{b} = \frac{sinC}{c}$$

We can use the **Law of Sines** to solve triangles when given _______ & ______.

We can also, use **Law of Sines** to solve triangles when given __________. However, we need to watch out for the **ambiguous case**.

Ex 1: Solve ΔABC: A = 50°, B = 62°, a = 4.

Ex 2: Solve ΔABC: B = 82°, b = 17, c = 15.

Ex 3: Solve ΔABC: C = 36°, b = 17, c = 16.

Ex 4: Solve ΔABC: A = 36°, a = 2, b = 7

Ex 5: A satellite passes over two tracking stations, A and $\boldsymbol{B}$, 100 km apart. When the satellite is between the two stations the angle of elevation at the stations are measured as 84.5° and 88.2° respectively. What is the distance the satellite and station *A.?* How high is the satellite of the ground?

Now you try. ☺

To find the distance across a river, a surveyor chooses point A and B, which are 200 ft. apart on one side of the river. She chooses a reference point C on the opposite side of the river and finds that $< BAC = 82°$ and $< ABC = 52°$. Find the distance across the river.