**PRIMO Lesson Seven Handout**

**Law of Sine and Cosine**

The laws of sine and cosine are simple, concrete formulas for the determination of side lengths and areas of triangles. The law of sine, used to find the area of triangles and its correlation to the circumscribed circle. Specifically, in , ; , with R denoting the radius of the triangle’s circumscribed circle. The law of cosine states that for sides *a*, *b*, *c* within a triangle where denotes the angle between sides *a* and *b*, .

The applications of these formulas are usually when encountering problems that you might forcibly try to resolve. In this case, the law of sine and cosine are useful in finding a specific component of the triangle.

**Q1.** If a triangle ABC has sides BC=2, AC=4, , find

**Q2.** Given in , , , , find the area of the triangle without using the Heron’s Formula.

**Q3.** In triangle ABC, side AB= 10 cm, side AC= 14 cm, and the area of the triangle is 42square cm. Additionally, the angle BAC is obtuse. Find the measure of angle BAC and the length of side BC.

**Q4.** If there are two triangles ABC that satisfy , , find the range of .