Applying Law of Sines/

**CORE STANDARDS**

G.SRT.10

G.SRT.11

LESSON

**6-4**

Cosines

 Secondary Math 3

OBJECTIVE **1. I can use the Law of Sines and Law of cosines to real world problems.**

NOTES Law of Sines:

 $\frac{sinA}{a}=\frac{sinB}{b}=\frac{sinC}{c}$ or $\frac{a}{sinA}=\frac{b}{sinB}=\frac{c}{sinC}$

 Law of Cosines:

$$a^{2}=b^{2}+c^{2}-2bc\cos(A)$$

Problem Solving: 1. Draw a picture.

 2. Determine what is being asked.

 3. Use appropriate tools.

 4. Check your answers

EXAMPLES Solve each problem.

1. You and a friend hike 1.3 kilometers due west from a campsite. At the same time, two other friends hike 1.7 kilometers at a heading of N 17° W from the campsite. To the nearest tenth of a kilometer, how far apart are the two groups?
2. Two airplanes leave an airport at the same time on different runways. One flies on a bearing of N 57° E (57° east of north) at 320 miles per hour. The other airplane flies on a bearing of S 23° E (23° east of south) at 310 miles per hour. How far apart will the airplanes be after 1.5 hours?

PRACTICE **6-4** NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 [SHOW YOUR WORK]

1. Lighthouse B is 8 miles east of lighthouse A. A boat leaves A and sails 6 miles. At this time, it is sighted from B. If the bearing of the boat from lighthouse B is S 71° W, how far from lighthouse B is the boat? Round your answer to the nearest mile?
2. An air traffic controller is tracking a plane 2.3 miles due north of the radar tower. A second plane is located 3.6 miles from the tower at a heading of S 72° W. To the nearest tenth of a mile, how far apart are the two planes?
3. Two fire-lookout stations are 15 miles apart, with station B directly west of station A. Both stations spot a fire. The bearing of the fire from station A is S 28° W and the bearing of the fire from station B is S 49° E. How far, to the nearest tenth of a mile, is the fire from each lookout station?
4. The dimensions of a triangular flag are 15 inches by 24 inches by 29 inches. To the nearest tenth, what is the measure of the angle formed by the two shorter sides?
5. A 25-ft water slide has a 10.8-ft. ladder which meets the slide at a 100° angle. To the nearest tenth, what is the distance between the end of the slide and the bottom of the ladder?
6. After a wind storm, you notice that your 12-foot flagpole may be leaning, but you are not sure. From a point on the ground 10 feet from the base of the flagpole, you find that the angle of elevation to the top is 52°. Find the angle, to the nearest degree, that the flagpole makes with the ground and determine if it is leaning or not.