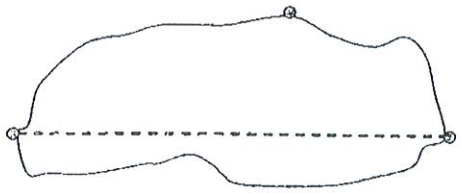
Act. #33 Law of Sines Law of Cosines

1

A baseball player in center field is playing approximately 330 feet from the television camera that is behind home plate. A batter hit a fly ball that goes to the wall that is 420 feet from the camera. Approximate the number of feet the center fielder had to run to make the catch if the camera turned 9° in the following the play.

5

To approximate the maximum length of a pond a surveyor starts at Point A and walks to a position that is 380 meters Northeast of the staring point to Point B. The surveyor then walks to Point C, which is 240 meters Southeast of the Secon Point. The angle formed by Segment $\overline{AB}$ and $\overline{BC}$ is 100°. Approximate the maximum distance across the pond.

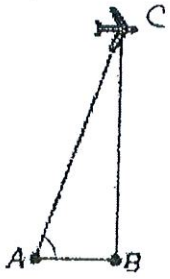


2

A poll tilts towards the sun at an 8° angle from the vertical at it casts a 22-ft shadow. The angle of elevation from the shadow to the top of the pole is 43°. How tall is the poll?

3

SATELLITES: Two radar stations 2.4 miles apart are tracking an airplane. The straight-line distance between Station *A* and the plane is 7.4 miles. The straight-line distance between Station *B* and the plane is 6.9 miles. What is the angle of elevation from Station *A* to the plane? Round to the nearest degree.



4

SKATING: During a figure skating routine, Jackie and Peter skate apart with an angle of 15° between them. Jackie skates for 5 meters and Peter skates for 7 meters. How far apart are the skaters?

Continuation of Ws #33 "Law of Sines and Cosines" Project

6. Two airplanes leave an airport at the same time. An hour later they are 189 km apart. If one plane traveled 244 km and the other plane traveled 168 km during the hour, find the angle between their flights.

7. At a birthday party, there was only one ballon bundle set up and it was in the middle of everything. The light was shinning down on the ballon bundle at an angle so it created a shadow. Gabe's friend, Dan, wondered how long the shadow would be. Gabe told him the ballon bundles height was 1.75 m. Dan figured that the balloon was perpendicular to the ground, creating a 90 degree angle from the floor. From the way the light was directed, it created a 64 degree angle of elevation. How far would the shadow be?

8. To approximate the length of the lake, a surveyor starts at one end of the lake and walks 245 yards. He then turned 110 degrees and walks 270 yards until he arrives straight across from where he started on the other side of the lake. Approximately how long is the lake?

9. A triangular lot sits at the corner of two streets that intersects at an angle of 58 degrees. One street side is 32 meters and the other is 40 Meters. How long is the back of the lot (third side) to the nearest meter?

10. After a hurricane, the small tree in my neighbors yard was leaning. To keep it from falling, we nailed a 6 foot strap into the ground 4 feet from the base of the tree. We attached the strap to the tree 3.5 feet above the ground. How far from vertical was the tree leaning?

11. John wants to measure the height of a tree. He walks exactly 100 ft from the base of the tree and looks up . The angle from the ground to the top of the tree is 33 degrees. This particular tree grows at an angle of 83 degrees with respect to the ground rather than vertically. How tall is the tree?

12. Larry is having a terrible time at his party, and to make things worse, an evil clown, Bongo, keeps chasing him to the rose bush 11.2 yards away, then to hs house 8.4 yards away, AND BACK to a TREE 6.1 yds AWAY. They run in a perfectly straight line to each landmark. What are the three angles that they are making as they run to each destination?
FIND the LARGEST ANGLE FIRST (across from house), then angle across from TREE.

Act. #52 (cont.)

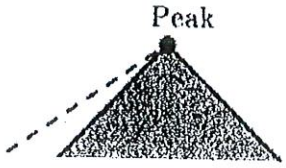
13

Lisa is 800 meters from the base of a mountain. From where she stands, she measures the angle of elevation to the peak of the mountain to be 38°. She then walks to the base of the mountain and measures the new angle of elevation, this time getting 49°.

How far is Lisa from the peak of the mountain when she is standing at its base?

[ ] m

Round your answer to the nearest meter.



14

James is standing 10 meters away from Samantha.

- A bird is located in the sky at a point between where James and Samantha are standing.
- James is looking up at the bird at an angle of elevation of 74°.
- Samantha is looking up at the bird at an angle of elevation of 47°.

Approximately how far is the bird from Samantha?

A 7.6 meters

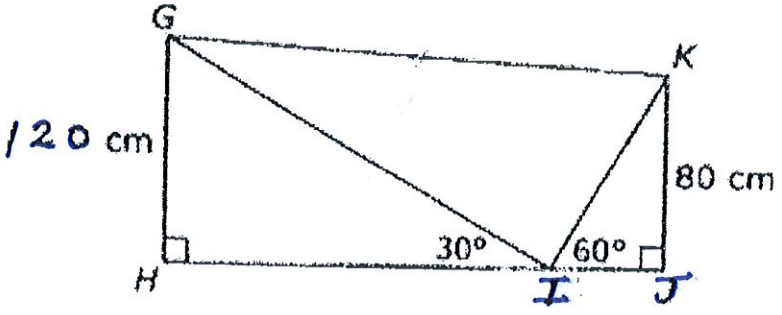
B 8.5 meters

C 11.2 meters

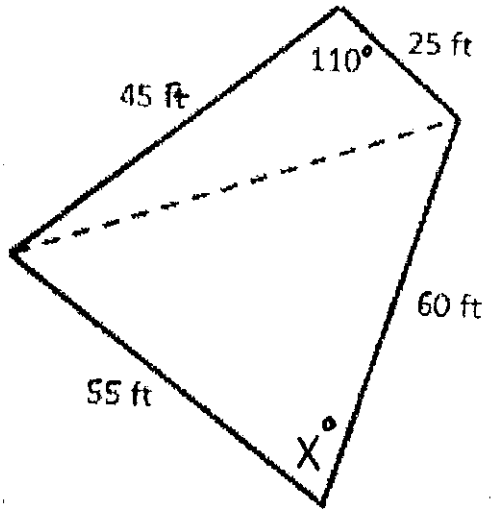
D 13.1 meters

15

What is the *approximate* length of $\overline{HJ}$ in the diagram below?



16



17 Juan and Romella are standing at the seashore 10 miles apart. The coastline is a straight line between them. Both can see the same ship in the water. The angle between the coastline and the line between the ship and Juan is 35 degrees. The angle between the coastline and the line between the ship and Romella is 45 degrees. How far is the ship from Juan?

18 Jack is on one side of a 200-foot-wide canyon and Jill is on the other. Jack and Jill can both see the trail guide at an angle of depression of 60 degrees. How far are they from the trail guide?

19 Tom, Dick, and Harry are camping in their tents. If the distance between Tom and Dick is 153 feet, the distance between Tom and Harry is 201 feet, and the distance between Dick and Harry is 175 feet, what is the angle between Dick, Harry, and Tom?

20 Three boats are at sea: Jenny one (J1), Jenny two (J2), and Jenny three (J3). The crew of J1 can see both J2 and J3. The angle between the line of sight to J2 and the line of sight to J3 is 45 degrees. If the distance between J1 and J2 is 2 miles and the distance between J1 and J3 is 4 miles, what is the distance between J2 and J3?