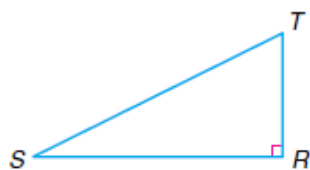


## CHECK FOR UNDERSTANDING

**Communicating Mathematics** Read and study the lesson to answer each question.

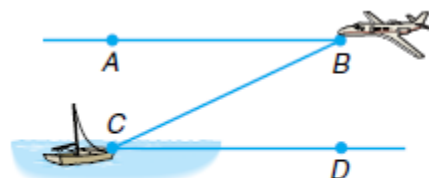
1. State which trigonometric function you would use to solve each problem.

- If  $S = 42^\circ$  and  $ST = 8$ , find  $RS$ .
- If  $T = 55^\circ$  and  $RT = 5$ , find  $RS$ .
- If  $S = 27^\circ$  and  $TR = 7$ , find  $TS$ .



2. Write a problem that could be solved using the tangent function.

3. Name the angle of elevation and the angle of depression in the figure at the right. Compare the measures of these angles. Explain.

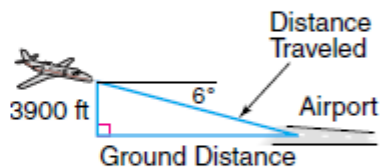


4. Describe a way to use trigonometry to determine the height of the building where you live.

5. **Fire Fighting** The longest truck-mounted ladder used by the Dallas Fire Department is 108 feet long and consists of four hydraulic sections. Gerald Travis, aerial expert for the department, indicates that the optimum operating angle of this ladder is  $60^\circ$ . The fire fighters find they need to reach the roof of an 84-foot burning building. Assume the ladder is mounted 8 feet above the ground.

- Draw a labeled diagram of the situation.
- How far from the building should the base of the ladder be placed to achieve the optimum operating angle?
- How far should the ladder be extended to reach the roof?

6. **Aviation** When a 757 passenger jet begins its descent to the Ronald Reagan International Airport in Washington, D.C., it is 3900 feet from the ground. Its angle of descent is  $6^\circ$ .



- What is the plane's ground distance to the airport?
- How far must the plane fly to reach the runway?

7. **Boat Safety** The Cape Hatteras lighthouse on the North Carolina coast was built in 1870 and rises 208 feet above sea level. From the top of the lighthouse, the lighthouse keeper observes a yacht and a barge along the same line of sight. The angle of depression for the yacht is  $20^\circ$ , and the angle of depression for the barge is  $12^\circ 30'$ . For safety purposes, the keeper thinks that the two sea vessels should be at least 300 feet apart. If they are less than 300 feet, she plans to sound the horn. How far apart are these vessels? Does the keeper have to sound the horn?