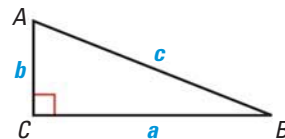EXAMPLE 4
on p. 854
for Exs. 21–28

SOLVING TRIANGLES Solve $\triangle ABC$ using the diagram and the given measurements.

21. $A = 35°, c = 16$ 　　　　22. $B = 53°, a = 12$

23. $B = 18°, c = 24$ 　　　　24. $A = 67°, b = 7$

25. $B = 75°, a = 15$ 　　　　26. $A = 49°, c = 27$

27. $A = 64°, b = 32$ 　　　　28. $B = 24°, c = 10.8$

29. **CHALLENGE** A procedure for approximating π based on the work of Archimedes is to inscribe a regular hexagon in a circle.

　　a. Use the diagram at the right to solve for x. What is the perimeter of the hexagon?

　　b. Show that a regular n-sided polygon inscribed in a circle of radius 1 has a perimeter of $2n \cdot \sin\left(\dfrac{180}{n}\right)°$.

　　c. Use the result from part (b) to find an expression in terms of n that approximates π. Then evaluate the expression when $n = 50$.
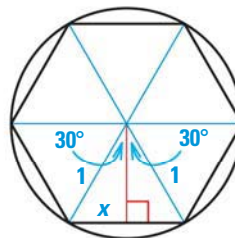
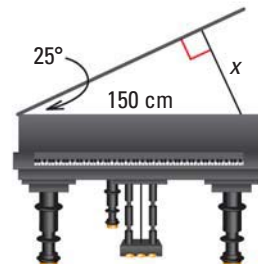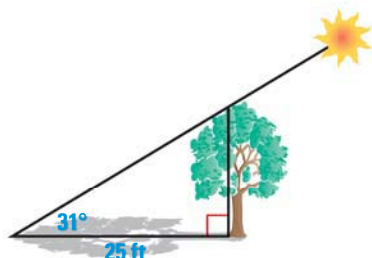## PROBLEM SOLVING

In Exercises 30 and 31, use the information in the diagram to solve the problem.

30. **TREE HEIGHT** A tree casts the shadow shown. What is the height of the tree?

31. **GRAND PIANO** Find the length of the prop holding open the piano.

TEXAS @HomeTutor for problem solving help at classzone.com

32. **RAILWAY** The Falls Incline Railway at Niagara Falls has an angle of elevation of 36°. The railway extends a horizontal distance of about 138 feet. Find the height and length of the railway.

33. **TAKS REASONING** A submersible traveling at a depth of 250 feet dives at an angle of 15° with respect to a line parallel to the water's surface. It travels a horizontal distance of 1500 feet during the dive. What is the depth of the submersible after the dive? *Explain* how the angle of the dive affects the final depth.

34. **MULTIPLE REPRESENTATIONS** You are climbing Mount Massive in Colorado. You are at an altitude of 11,200 feet. You measure the angle of elevation to a ridge above you to be 29.4°. The distance (along the face of the mountain) between you and the ridge is 6315 feet.

　　a. **Drawing a Diagram** Draw a diagram that represents this situation.

　　b. **Writing an Equation** Write and solve an equation to find the altitude of the ridge.