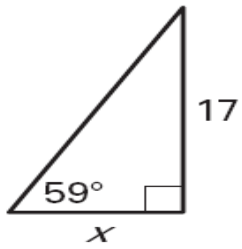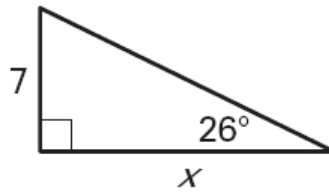Name : _____

Date : _____ Period : ____

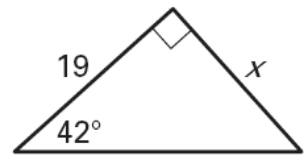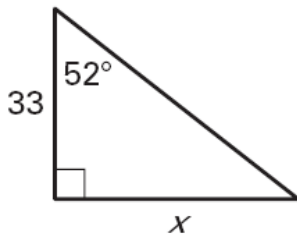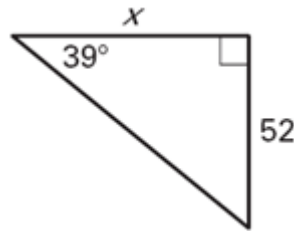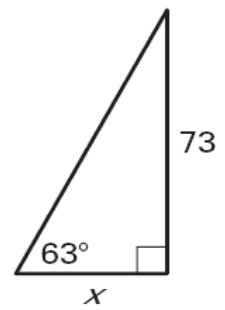**Find the value of x. Round to the nearest tenth.**

1.

17

59°

x

2.

7

26°

x

3.

19

42°

x

4.

52°

33

x

5.

x

39°

52

6.

73

63°

x

7.

x

27°

25

8.

21

x

44°

9.

58

73°

x
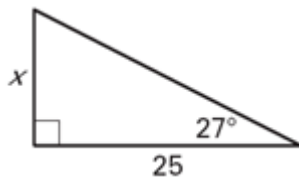
Find the area of the triangle. Round to the nearest tenth.

10.

11 cm

57°

x

11.

24 ft

61°

x

12.

38 in.

x

38°
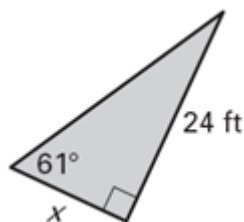
Find the perimeter of the triangle. Round to the nearest tenth.

13.

$55°$

47 in.

14.

$66°$

10 ft

15.

$41°$

26 m

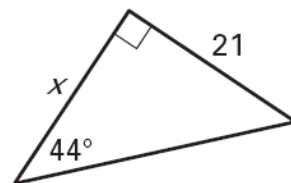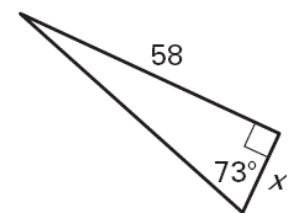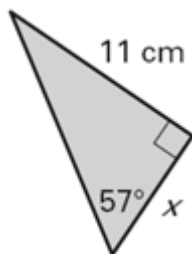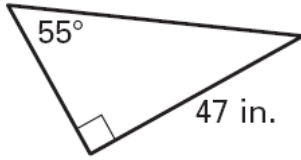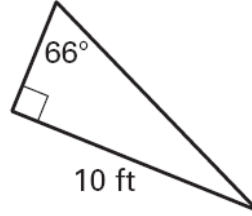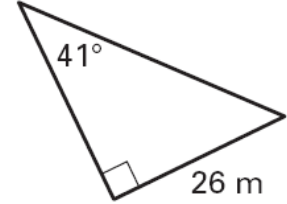16. **Perimeter** What is the perimeter of an equilateral triangle with an altitude of 15 inches?

17. In the diagram below, $AC = 42$. What is AD? Round your answer to the nearest tenth.

B

$41°$

$35°$

A D C
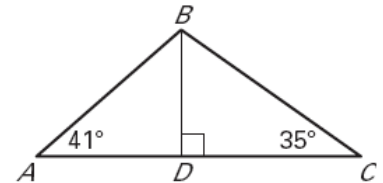
In Exercises 18-20, use the figure of the lighthouse.

18. At 2 P.M., the shadow of a lighthouse is 19 feet long and the angle of elevation is 75°. Find the height of the lighthouse.
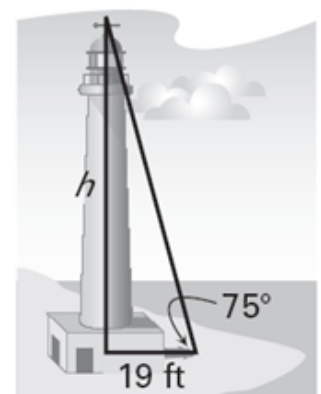
19. At 4 P.M., the angle of elevation of the sun is 40°. Find the length of the shadow cast by the lighthouse.

h

$75°$

19 ft

20. At 6 P.M., will the length of the shadow be longer or shorter than it was at 4 P.M.? Explain.

In Exercises 21 and 22, use the figure below.

Flagpole When the sun is shining at a 62° angle of elevation a flagpole forms a shadow of length *x* feet. Later, the sun shines at an angle of 48°, and the shadow is 16 feet longer than before.
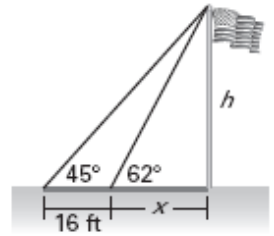
21. Write two expressions for the height *h* of the flagpole, in terms of x.

22. How tall is the flagpole? Round your answer to the nearest tenth of a foot.

23. **Distance** You are on the west side of the Washington Monument which is 555 feet tall. Your friend is on the opposite (east) side. The angle of elevation from your position to the top of the monument is 42°. The angle of elevation from your friend's position to the top of the monument is 65°. To the nearest foot, how far are you from your friend?

Not drawn to scale
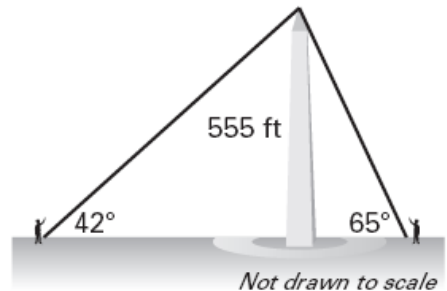
24. You are standing on top of a 60 foot building looking up at the top of a 150 foot building. The angle of elevation you measure is 30°. How far apart are the buildings? Round to the nearest tenth.
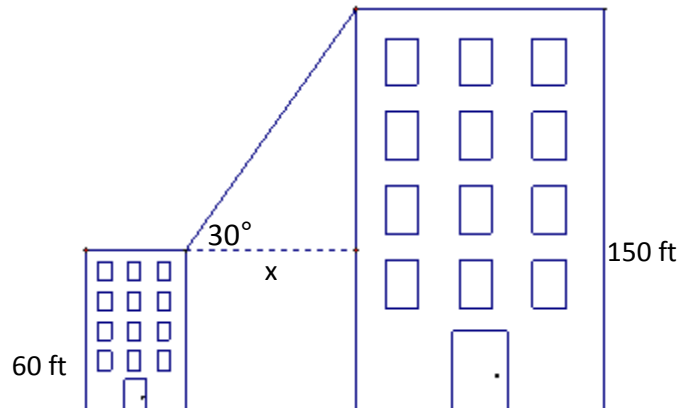
Answer Key

1. 10.2
2. 14.4
3. 17.1
4. 42.2
5. 64.2
6. 37.2
7. 12.7
8. 21.7
9. 17.7
10. 39.3 cm^2
11. 159.6 ft^2
12. 924.1 in^2
13. 137.3 in.
14. 25.4 ft
15. 95.5 m
16. about 51.96 in.
17. 18.7
18. 70.9 ft
19. 84.5 ft
20. Longer; as the sun sets the angle decreases and the tangent of the angle also decreases. The height of the lighthouse is constant so the shadow has to lengthen for the ratio to get smaller.
21. $h = x(\tan 62°)$; $h = (x + 16)(\tan 45°)$
22. 43.4 ft
23. 875.2 ft
24. 155.9 ft