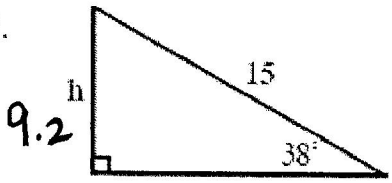
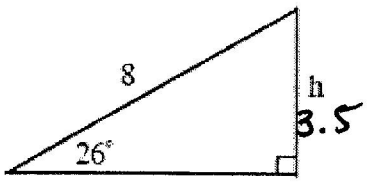
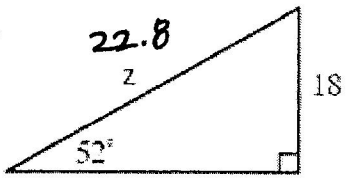
Use trig ratios to solve for the missing side or angle. Round to the nearest tenth.

1. 

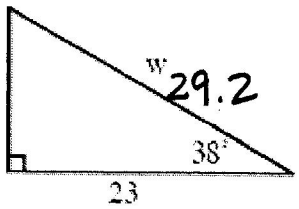
9.2

2. 

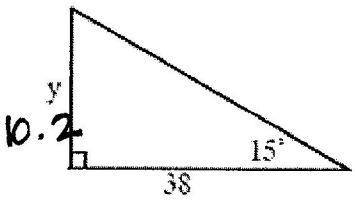
3.5

3. 

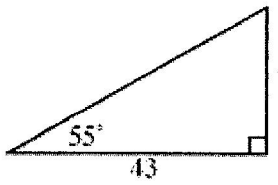
22.8

4. 

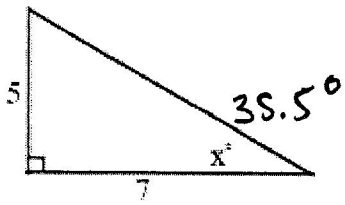
29.2

5. 

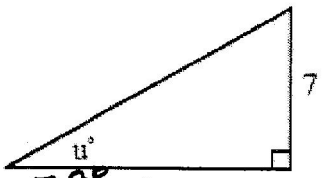
10.2

6. 

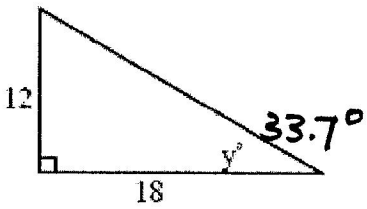
61.4

7. 

35.5°

8. 

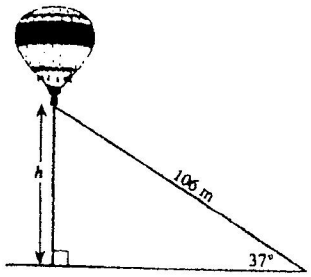
37.9°

9. 

33.7°

Multiple-Choice:

10) Using the diagram below find the balloon's height, h, above the ground.



A. 106cos(37°) **B.** 106tan(37°) **C.** 106÷sin(37°)
D. sin(37°)÷106 **E.** 106sin(37°)

11) A 5.5-m ladder is resting against a wall. If the ladder makes an angle of 60° with the ground, how far from the wall is the base of the ladder, and how high up the wall does the ladder reach?

A. 2.75m from the wall and $2.75\sqrt{3}$ m up the wall

B. $2.75\sqrt{3}$ m from the wall and 2.75m up the wall

C. 2.75m from the wall and $2.75\sqrt{2}$ m up the wall

D. $2.75\sqrt{2}$ m from the wall and 2.75m up the wall

E. None of these

12) An underground parking lot is being constructed 8m below ground level. If the exit ramp is to rise at an angle of 15°, how long will the ramp be?

A. 8÷tan(15°) **B.** 8tan(15°) **C.** 8÷sin(15°) **D.** sin(15°)÷8 **E.** 8sin(15°)

13) The shadow of a tree is 20m long. The angle of elevation to the top of the tree is 50°. What is the height of the tree?

A. 20÷tan(50°) **B.** 20tan(50°) **C.** 20÷sin(50°) **D.** tan(50°)÷20 **E.** 20sin(50°)

For #14-21, draw a triangle and label it. Show your work. Round to the nearest tenth when necessary.

14) The base of a 9.0m ladder is $4.5\sqrt{2}$ m from the wall of a building. What is the angle of elevation of the ladder?

45°

15) I measured the length of a tree's shadow twice today. Once when the angle of depression from the sun to the top of the tree was 30° and once when it was 60°. If the difference in the length of the two shadows I measured was 40 ft, how tall is the tree?

$20\sqrt{3}$ ft

16) A damsel is in distress and is being held captive in a tower. Her knight in shining armor is on the ground below with a ladder. When the knight stands 15 feet from the base of the tower and looks up at his precious damsel, the angle of elevation to her window is 60 degrees. How long does the ladder have to be?

30 ft

17) You are 200 yards from a river. Rather than walking directly to the river, you walk 400 yards along a straight path to the river's edge. Find the acute angle between path and the river's edge.

30°

18) A 12 meter flagpole casts a 9 meter shadow. Find the angle of elevation of the sun.

53.1°

19) Suppose you're flying a kite, and it gets caught at the top of the tree. You've let out all 100 feet of string for the kite, and the angle that the string makes with the ground is 75 degrees. Instead of worrying about how to get your kite back, you wonder. "How tall is that tree?"

96.6 ft

20) A submersible traveling at a depth of 250 feet dives at an angle of 15º 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?

651.9 ft

21) A fire department's longest ladder is 110 feet long, and the safety regulation states that they can use it for rescues up to 100 feet off the ground. What is the maximum safe angle of elevation for the rescue ladder?

65.4°