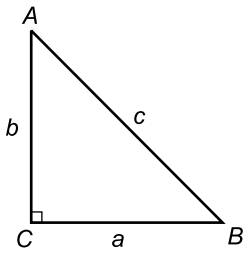
NAME _____ DATE _____ PERIOD _____

Practice

Applying Trigonometric Functions

Solve each problem. Round to the nearest tenth.

1. If $A = 55° 55'$ and $c = 16$, find a.



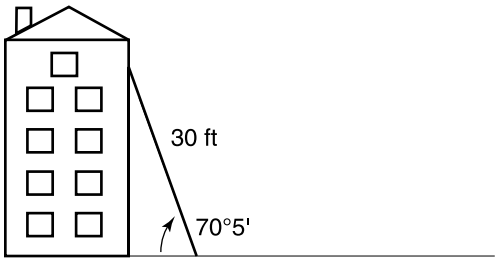
2. If $a = 9$ and $B = 49°$, find b.

3. If $B = 56° 48'$ and $c = 63.1$, find b.

4. If $B = 64°$ and $b = 19.2$, find a.

5. If $b = 14$ and $A = 16°$, find c.

6. ***Construction*** A 30-foot ladder leaning against the side of a house makes a $70° 5'$ angle with the ground.



a. How far up the side of the house does the ladder reach?

b. What is the horizontal distance between the bottom of the ladder and the house?

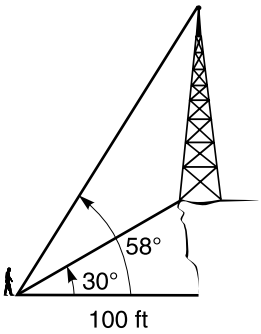
7. ***Geometry*** A circle is circumscribed about a regular hexagon with an apothem of 4.8 centimeters.

a. Find the radius of the circumscribed circle.

b. What is the length of a side of the hexagon?

c. What is the perimeter of the hexagon?

8. ***Observation*** A person standing 100 feet from the bottom of a cliff notices a tower on top of the cliff. The angle of elevation to the top of the cliff is 30°. The angle of elevation to the top of the tower is 58°. How tall is the tower?



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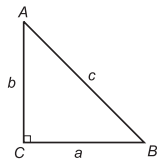
NAME _____ DATE _____ PERIOD _____

5-4

Practice

Applying Trigonometric Functions

Solve each problem. Round to the nearest tenth.



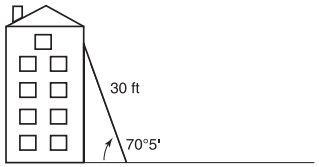
1. If $A = 55° 55'$ and $c = 16$, find a.
13.3

2. If $a = 9$ and $B = 49°$, find b.
10.4

3. If $B = 56° 48'$ and $c = 63.1$, find b.
52.8

4. If $B = 64°$ and $b = 19.2$, find a.
9.4

5. If $b = 14$ and $A = 16°$, find c.
14.6



6. ***Construction*** A 30-foot ladder leaning against the side of a house makes a 70° 5′ angle with the ground.

a. How far up the side of the house does the ladder reach?
about 28.2 ft

b. What is the horizontal distance between the bottom of the ladder and the house?
about 10.2 ft

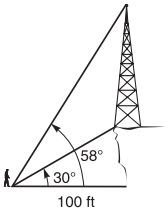
7. ***Geometry*** A circle is circumscribed about a regular hexagon with an apothem of 4.8 centimeters.

a. Find the radius of the circumscribed circle. **about 5.5 cm**

b. What is the length of a side of the hexagon? **about 5.5 cm**

c. What is the perimeter of the hexagon? **about 33 cm**

8. ***Observation*** A person standing 100 feet from the bottom of a cliff notices a tower on top of the cliff. The angle of elevation to the top of the cliff is 30°. The angle of elevation to the top of the tower is 58°. How tall is the tower?
about 102.3 ft



NAME _____ DATE _____ PERIOD _____

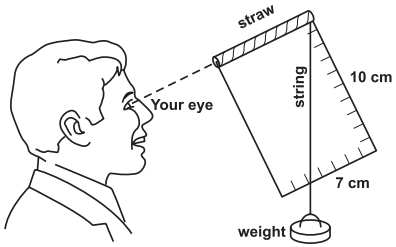
5-4

Enrichment

Making and Using a Hypsometer

A **hypsometer** is a device that can be used to measure the height of an object. To construct your own hypsometer, you will need a rectangular piece of heavy cardboard that is at least 7 cm by 10 cm, a straw, transparent tape, a string about 20 cm long, and a small weight that can be attached to the string.

Mark off 1-cm increments along one short side and one long side of the cardboard. Tape the straw to the other short side. Then attach the weight to one end of the string, and attach the other end of the string to one corner of the cardboard, as shown in the figure below. The diagram below shows how your hypsometer should look.



To use the hypsometer, you will need to measure the distance from the base of the object whose height you are finding to where you stand when you use the hypsometer.

Sight the top of the object through the straw. Note where the free-hanging string crosses the bottom scale. Then use similar triangles to find the height of the object.

1. Draw a diagram to illustrate how you can use similar triangles and the hypsometer to find the height of a tall object.
See students' diagrams.

Use your hypsometer to find the height of each of the following. **See students' work.**

2. your school's flagpole
3. a tree on your school's property
4. the highest point on the front wall of your school building
5. the goal posts on a football field
6. the hoop on a basketball court
7. the top of the highest window of your school building
8. the top of a school bus
9. the top of a set of bleachers at your school
10. the top of a utility pole near your school