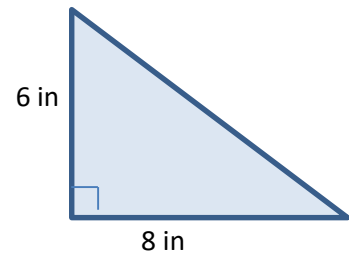


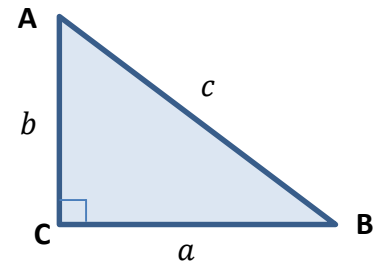
**Do all of the following problems in your notebook**

Write ratios for the 6 trigonometric functions based on the triangle to the right.



Solve  $\triangle ABC$  using the diagram to the left and the given information below.

- |                               |                                     |
|-------------------------------|-------------------------------------|
| 1. $A = 37^\circ$ ; $c = 22$  | No decimal answers for #6-10        |
| 2. $B = 41^\circ$ ; $c = 18$  | 6. $A = 45^\circ$ ; $c = 2\sqrt{2}$ |
| 3. $B = 56^\circ$ ; $a = 6.8$ | 7. $B = 30^\circ$ ; $c = 18$        |
| 4. $A = 70^\circ$ ; $c = 30$  | 8. $B = 60^\circ$ ; $a = 5$         |
|                               | 9. $A = 45^\circ$ ; $a = 13$        |
|                               | 10. $A = 30^\circ$ ; $b = 12$       |



11. The Duquesne Incline was built in Pittsburgh in 1877. It is used to transport people up and down the side of a mountain in cable cars. In 1877, the cost of a one-way trip was 5 cents. Today, the cost is one dollar. The track of the Duquesne Incline is about 800 feet long and the angle of elevation is 30 degrees.

- Draw a diagram of this scenario
- How high does the Duquesne Incline rise?

12. A ski slope at a mountain has an angle of elevation of 25.2 degrees. The vertical height of the slope is 1808 feet. How long is the ski slope? (draw a diagram as well)

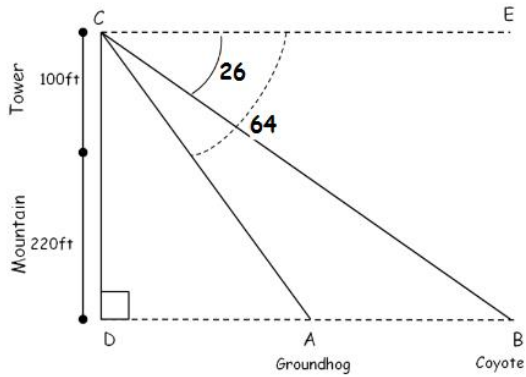
13. A gangplank is a narrow ramp used for boarding or leaving a ship. The maximum safe angle of elevation for a gangplank is 20 degrees. Suppose a gangplank is 10 feet long. What is the closest a ship can come to the dock for the gangplank to be used? (draw a diagram as well)

14. You are standing 75 meters from the base of a building. You estimate that the angle of elevation to the top of the building is 80 degrees. What is the approximate height of the building? Suppose one of your friends is at the top of the building. What is the shortest distance between you and your friend?

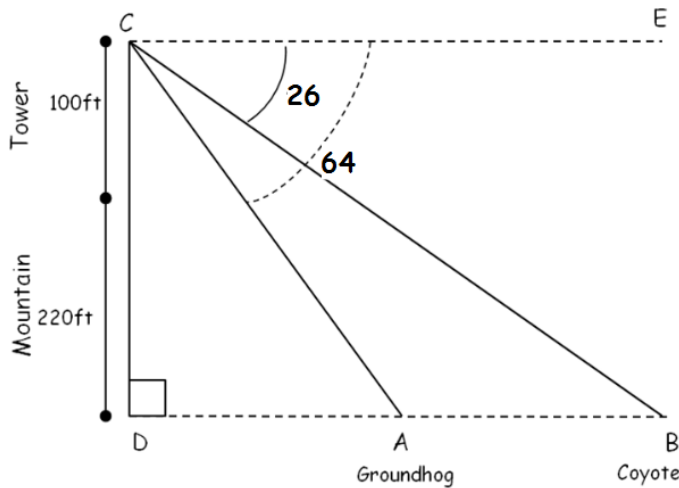
15.

Sam is in the top of a lookout tower on a mountain. He is observing the forest below, when he spots a groundhog. The groundhog is being stalked by a coyote (mmm, lunch!). The angle of depression from Sam to the groundhog is  $64^\circ$ , and the angle of depression from Sam to the coyote is  $26^\circ$ .

- a) Determine the distance from the base of the mountain to the groundhog. Show all work and round your answer to the nearest tenth.



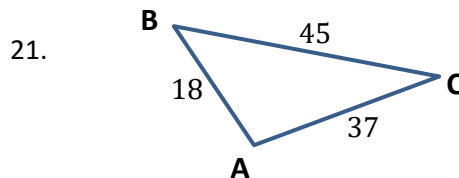
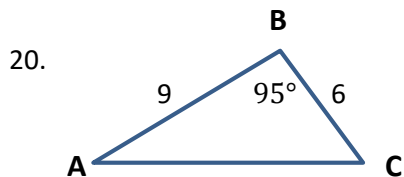
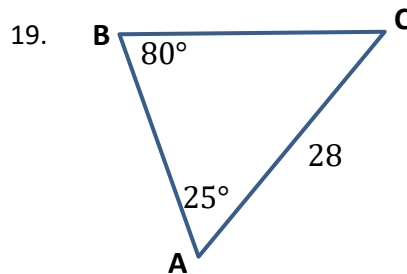
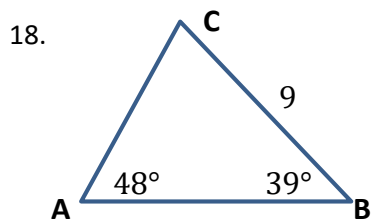
16.



- b) The coyote looks up and sees Sam. What is the angle of elevation at which he looks up? Justify your answer with complete sentences.

17. An airplane that is maintaining a safe altitude of 35,000 feet is currently 500,000 feet away from the airport at which it is landing. What is the angle of depression that the plane needs to descend at in order to make a safe landing on the runway? (draw a diagram as well)

Solve the triangles below. (round all answers to the nearest hundredth)



For the following problems, draw the triangle and label the parts of it that you are given. Then, use either the law of cosines or the law of sines to solve triangle ABC.

22.  $a = 15, b = 20, c = 25$

23.  $C = 90^\circ; a = 4; b = 11$

24.  $a = 48; b = 51; c = 36$

25.  $A = 48^\circ; B = 51^\circ; c = 36$

26.  $A = 96^\circ; B = 39^\circ; b = 13$

27.  $B = 80^\circ; C = 30^\circ; b = 34$

28.  $C = 95^\circ; a = 10; b = 12$

29.  $A = 60^\circ; b = 30; c = 28$