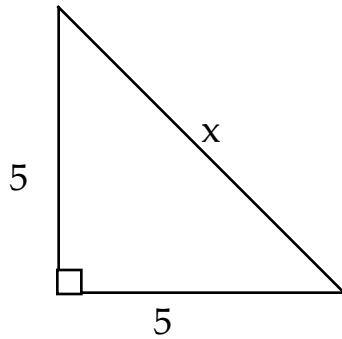# Vector Worksheet

Name_____

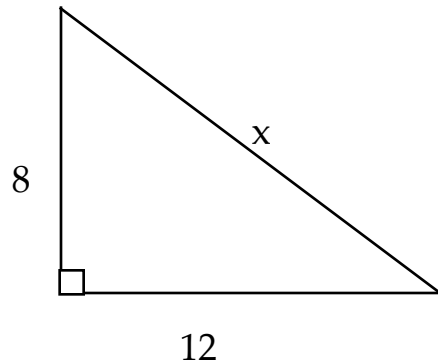Period_____

Directions: Use the Pythagorean Theorem to solve for x.

1.

5

x

5
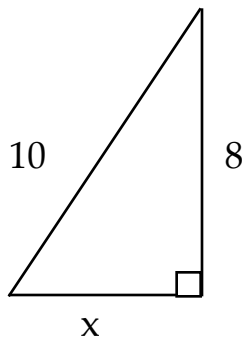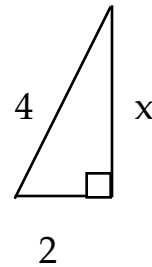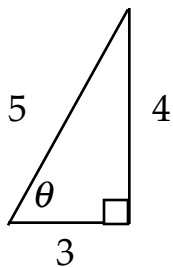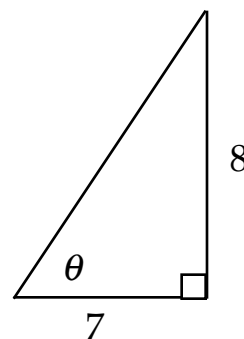
2.

8

x

12

3.

10

8

x

4.

4

x

2

Directions: Find the sin, cos, and tan of the angle θ.

5.

5

4

θ

3

6.

8

θ

7

7.

θ

5

13

12

8.

8

17

θ

15

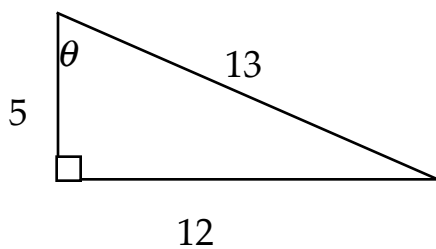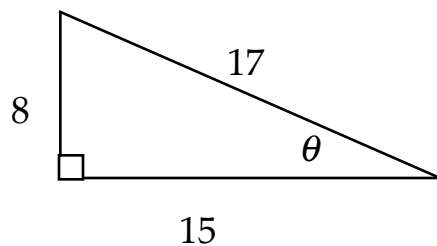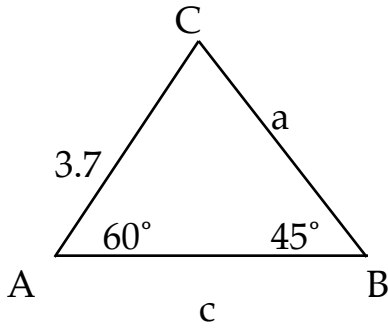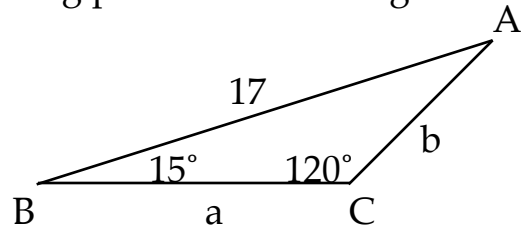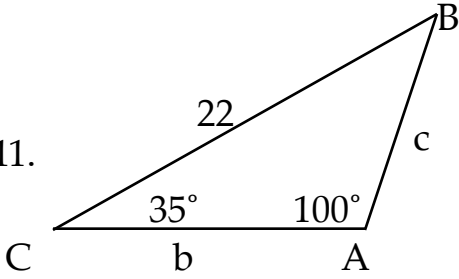**Directions**: Use the Law of Sines to find the missing parts of each triangle.
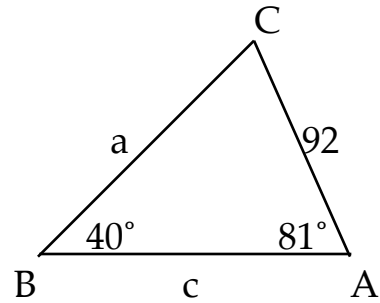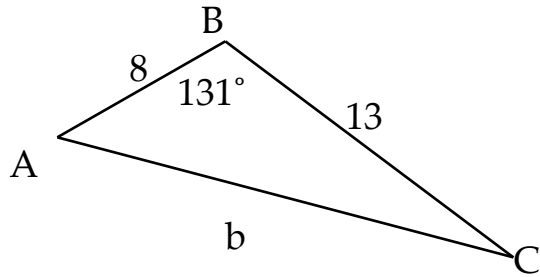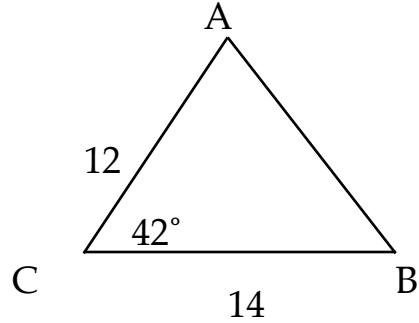
9.

10.

11.

12.

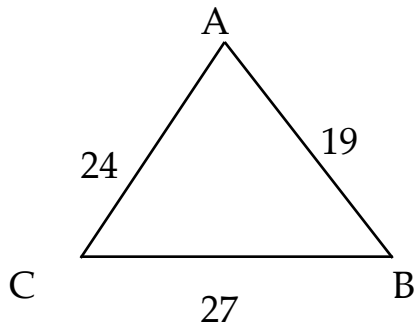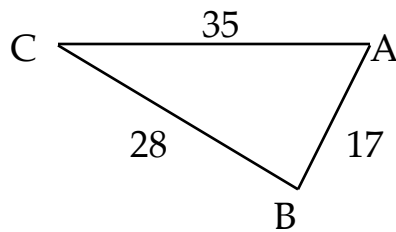**Directions**: Use the Law of Cosines to find the missing parts of each triangle.

13.

14.

15.

16.

Directions: Solve the following problems algebraically on a separate sheet of paper.

17. A hiker walks 4.5 km in one direction, then makes a 45° turn to the right and walks another 6.4 km. What is the magnitude of her displacement?

18. What is the magnitude of your displacement when you follow directions that tell you to walk 225 m in one direction, make a 90° turn to the left and walk 350 m, then make a 30° turn to the right and walk 125 m?

19. A car moving east at 45 km/h turns and travels west at 30 km/h. What is the magnitude and direction of the change in velocity?

20. A motorboat heads due east at 11 m/s relative to the water across a river that flows due north at 5.0 m/s. What is the velocity of the motorboat with respect to the shore?

21. An airplane flies due west at 185 km/h with respect to the air. There is a wind blowing at 85 km/h to the northeast relative to the ground. What is the plane's speed and direction with respect to the ground?

22. You are driving up a long inclined road. After 2.7 km you notice that signs along the roadside indicate that your elevation has increased by 170 m. (a) What is the angle of the road above the horizontal? (b) How far do you have to drive to gain an additional 45 m of elevation?

23. A lighthouse that rises 49 ft above the surface of the water sits on a rocky cliff that extends 19 ft from its base, as shown in the figure. A sailor on the deck of a ship sights the top of the lighthouse at an angle of 30.0° above the horizontal. If the sailor's eye level is 14 ft. above the water, how far is the ship from the rocks?