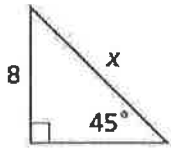
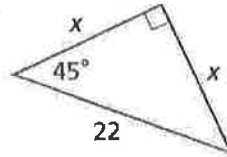


Use special right triangles to find the missing variable in each triangle. Then, find the area and perimeter of each triangle. Leave your answers in simplest radical form.

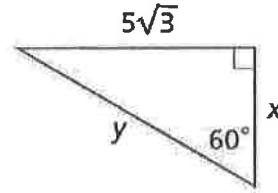
1.



2.



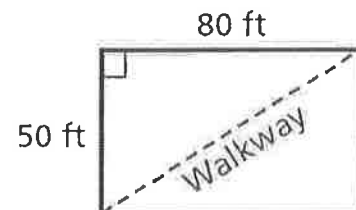
3.



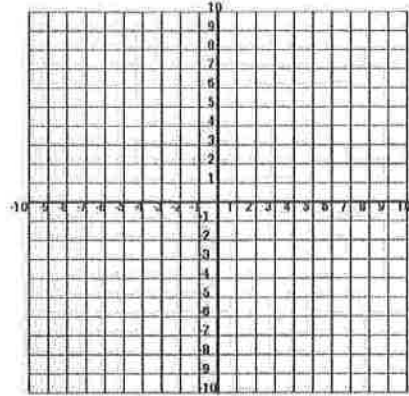
4. You and a friend start at the same point. You walk west 15 miles and your friend walks south 20 miles. How far apart are you?

5. A 10-foot ladder is leaned up against a wall. The base of the ladder is 5 feet away from the wall. How high up on the wall is the ladder? Round your answer to the nearest tenth.

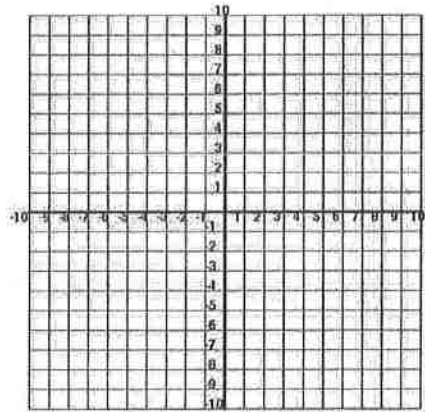
6. A nearby college is installing a walkway through the middle of a patch of grass so that students will not have to walk so far to get to class. How much farther (to the nearest foot) is it for students to walk around from point A to point B than it is to walk on the new walkway?



7. Given the triangle with vertices $A(2,0)$, $B(2,-5)$, $C(1,-5)$, find all side lengths and angle measures. Round your answers to the nearest tenth if necessary.



8. You and a friend just bought walkie-talkies with 6-mile range. If you are standing at the point $(3, 2)$ and your friend is at the point $(-1, -2)$, will you be able to hear each other? Show work to defend your answer.

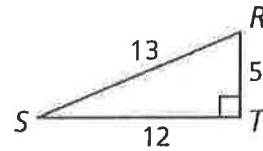


Determine which of the two acute angles has the given trigonometric ratio.

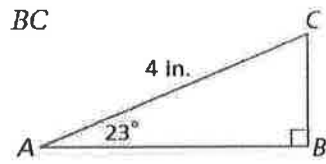
9. $\tan \theta = \frac{5}{12}$

10. $\cos \theta = \frac{12}{13}$

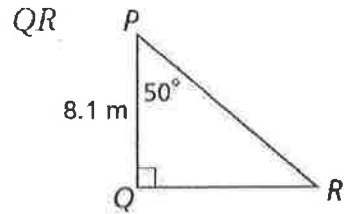
11. $\sin \theta = \frac{5}{13}$



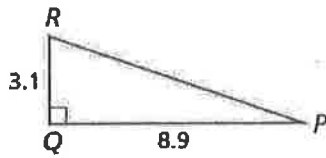
12. Find the length of BC. Round to nearest tenth.



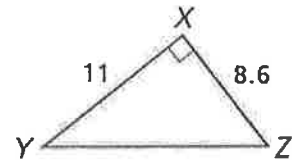
13. Find the length of QR. Round to the nearest tenth.



14. Find the measure of angle R and angle P. Round to the nearest tenth.



15. Find the measure of angle Y and angle Z. Round to the nearest tenth.



16. Joe is trying to find the height of a flagpole. The distance from the ground to his eyes is 6 feet and the distance from Joe to the flagpole is 10 feet. The angle formed from his horizontal line of sight to the top of the flagpole is 56.31° . Find the height of the flagpole to the nearest tenth of a foot.

17. A telephone pole is supported by steel cables as shown in the figure. If the phone company were planning on installing another cable on the other side 17 feet from the pole, how much total steel cable is used for both of the steel cables combined? Round your answer to the nearest tenth.



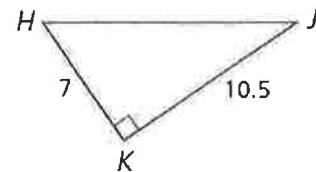
18. A forest ranger in a 120 foot observation tower sees a fire. The angle of depression to the fire is 8° . What is the horizontal distance between the tower and the fire? Round to the nearest foot.

19. A ramp is leaned on a porch that is 1.5 feet off the ground. If the angle a ramp makes with the ground is 14.5° , find the length of the ramp to the nearest tenth of a foot.

20. The pilot of a rescue helicopter is flying over the ocean at an altitude of 1250 feet. The pilot sees a life raft about 750 feet away (Horizontal distance). What is the angle of depression from the helicopter to the life raft to the nearest degree? Round your answer to the nearest tenth.

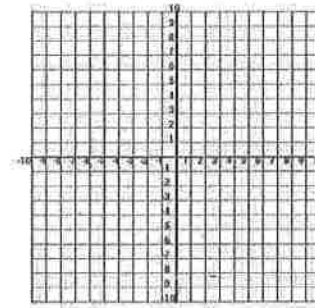
21. A 25 foot tall light pole casts a shadow on the ground that is 37 feet long. What is the angle of elevation from the end of the shadow to the top of the light pole? Round your answer to the nearest tenth.

22. Using triangle HJK, find all of the missing side lengths and angles. Round your answers to the nearest tenth.



23. When a new tree is planted, rope is tied to it and then staked to the ground to hold it upright. If 3 pieces of rope are tied to the tree 10 feet off the ground and the rope forms a 56.5° angle with the ground, how much rope would you need? Round your answer to the nearest tenth.

24. For a triangle with vertices $X(4,-6), Y(-3,1), Z(-3,-6)$, find all side lengths and angle measures.



25. Point K is exactly 13 units from the origin $(0,0)$. Which of the following are the possible coordinates for point K?

A. $(8, 15)$

B. $(13, 13)$

C. $(7, 6)$

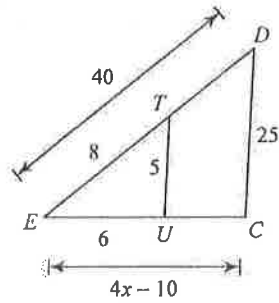
D. $(5, 12)$

26. In order to get to school each day, Michelle walks 3 miles east on Panther Drive, and then turns and walks 2 miles north on school road. How much farther is it for Michelle to walk along these two roads instead of walking in a straight line directly from school to her home? Round your answer to the nearest tenth.

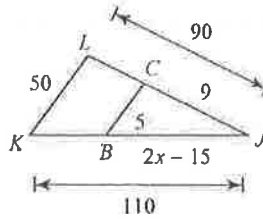
27. A free-fall ride at an amusement park casts a shadow 60 ft long. At the same time, a 6-foot-tall person standing in line casts a shadow 2 feet long. What is the height of the ride? Round your answer the nearest tenth of a foot.

Solve for x . The triangles in each pair are similar.

28)

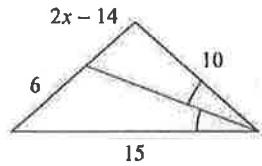


29)

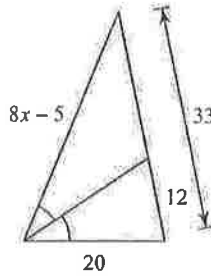


Solve for x .

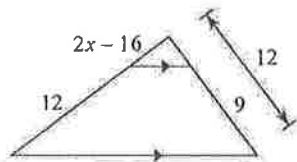
30)



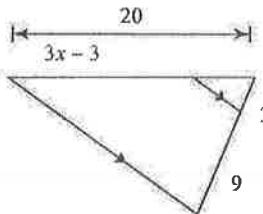
31)



32)

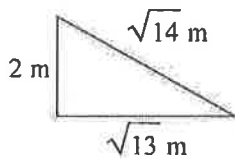


33)

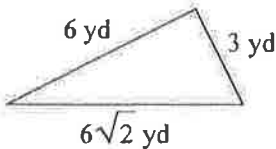


State if each triangle is acute, obtuse, or right.

34)



35)



36) It is given that rectangle $ABCD \sim EFGH$. The area of rectangle $ABCD$ is 135 in^2 and the area of rectangle $EFGH$ is 240 in^2 . If the width of rectangle $ABCD$ is 9 in., what is the length and width of rectangle $EFGH$?