Trigonometry 50 Pt. Bonus{For every correct answer you will receive 1 bonus point added to trigonometry test grade}
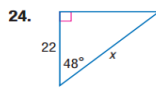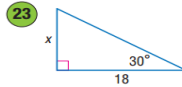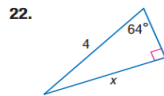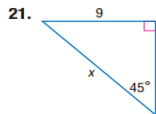
1. Identify the period of this function: $f(x) = 4 \sin \frac{\pi}{5} \theta$

2. Identify the amplitude of this function: $f(x) = -2 \cos 4\theta$

3. Identify the period of this function $f(x) = -2 \cos 4\theta$

4. Identify the amplitude of this function: $f(x) = \frac{1}{2} \sin \theta$

5. Sketch a graph of this trigonometric function {include 1 cycle and label x axis}: $f(x) = 3 \sin \theta$

6. Sketch a graph of this trigonometric function {include 1 cycle and label x axis}: $f(x) = \cos 5x$

7. Sketch a graph of this trigonometric function {include 1 cycle and label x axis}: $f(x) = 2 \sin 2x$

8. Sketch a graph of this trigonometric function {include 1 cycle and label x axis}: $f(x) = 5 \cos x$

9. Identify the period of this function: $f(x) = \sin \theta$

10. What are the three trigonometric ratios?

11. Label a 30-60-90 triangle with the appropriate RATIO OF SIDES relationships:

12. Label a 45-45-90 triangle with the appropriate RATIO OF SIDES relationships:

13. When do you use the inverse trigonometric functions?

14. What mode must your calculator always be in when using trigonometric ratios?

15. For a sine trigonometric graph that has no horizontal or vertical shift, where does one cycle begin?

16. For a cosine trigonometric graph that has no horizontal or vertical shift, where does one cycle begin?

17. How do you find the amplitude of a sine or cosine function?

18. How do you find the period of a sine or cosine function?

19. A plane is 30,000 feet off of the ground when it begins its approach to the runway. How far is the plane from the runway if the pilot lowers the nose at an angle of depression of $12°$ to meet the runway?

20. Gertie the gopher is looking at a tree that is 100 feet away from her nest. If the angle of elevation between Gertie's nest and the top of the tree is $23°$, how tall is the tree?

21. A straight water slide makes a $40°$ angle with the surface of the water. If the slide is 11.5 meters high, how long is the water slide?

22. An observer on a sea cliff with a height of 12 meters spots a shark fin through a pair of binoculars at an angle of depression of 5.7°. To the nearest meter, how far is the shark from the base of the cliff?

23. What is the measure of the angle with the ground that is made by a 200 ft supporting cable on a 150 foot tall cell phone tower?

24. A kite with a string 150 feet long makes an angle of 40° with the ground. Assuming that the string is straight, how high is the kite in the air?

25. A plane is flying at an altitude of 36,000 feet. From the pilot, the angle of depression to the airport tower is 32°. How far is the tower from a point directly beneath the plane?

26. A person stands at the window of a building so that his eyes are 12.6 meters above the level ground. An object is on the ground 58.5 meters away from the building on a line directly beneath the person. Compute the angle of depression of the person's line of sight to the object on the ground.

27. The height of a cell phone tower is 15 meters. A man looks at the tower from a distance of 120 meters. What is the angle of elevation of the top of the tower from the man?

28. Suppose the sun casts a shadow off a 35 foot tall building. If the angle of elevation to the sun is 60°, how long is the shadow that is cast?

29. A ramp was built by a loading dock. The height of the loading platform is 4 feet. Determine the length of the ramp if it makes a 32° with the ground.

30. A ladder is leaning against a building. The ladder is making an angle of 78° with the ground. If the ladder is reaching a height of 23 feet on the wall, how long is the ladder?

**Examples 3–4** Use a trigonometric function to find each value of x. Round to the nearest tenth.

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31. What happens to the cosine of an angle as the angle measure increases? {does the cosine increase or decrease}
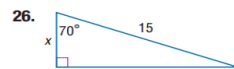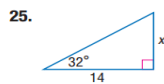
27. **PARASAILING** Refer to the beginning of the lesson and the figure at the right. Find a, the altitude of a person parasailing, if the tow rope is 250 feet long and the angle formed is 32°. Round to the nearest tenth.
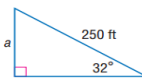
28. **BRIDGES** Devon wants to build a rope bridge between his treehouse and Cheng's treehouse. Suppose Devon's treehouse is directly behind Cheng's treehouse. At a distance of 20 meters to the left of Devon's treehouse, an angle of 52° is measured between the two treehouses. Find the length of the rope.

Find the value of x. Round to the nearest tenth.

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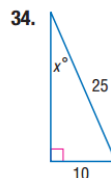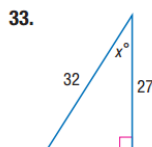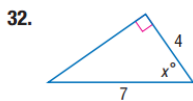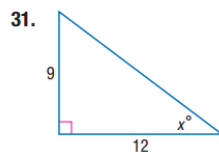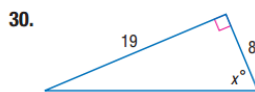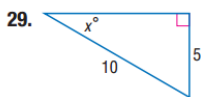
35. **SQUIRRELS** Adult flying squirrels can make glides of up to 160 feet. If a flying squirrel glides a horizontal distance of 160 feet and the angle of descent is 9°, find its change in height.

36. **HANG GLIDING** A hang glider climbs at a 20° angle of elevation. Find the change in altitude of the hang glider when it has flown a horizontal distance of 60 feet.

Use trigonometric functions to find the values of x and y. Round to the nearest tenth.

37.

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