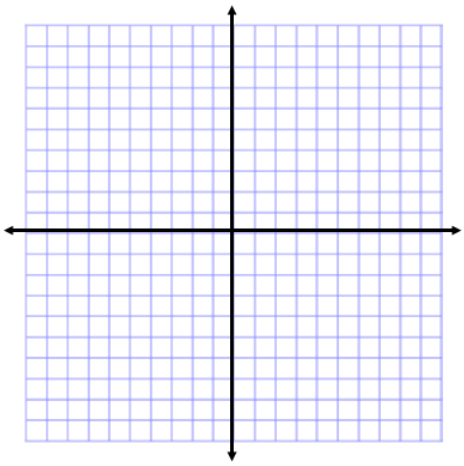
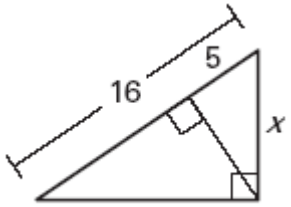
Geometry Final Exam Review

Graph the equation.

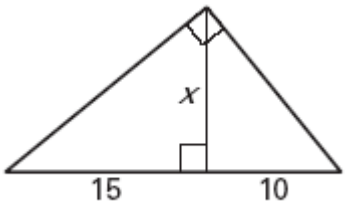
1. $(x+1)^2+(y+3)^2=16$



2. **Find the value of *x*. write your answer in simplest radical form.**

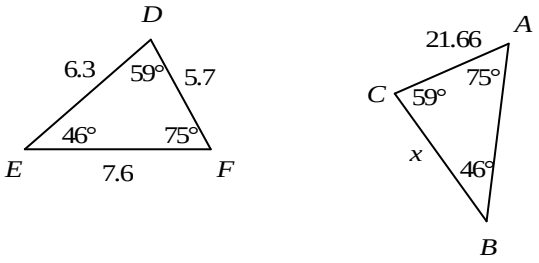


3. **Find the value of *x*. write your answer in simplest radical form.**



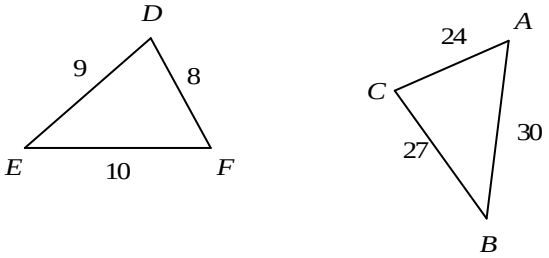
Each pair of polygons is similar. Write a similarity statement, and find x, the measures of the indicated sides, and the scale factor.

4. $\overline{CE}$ and $\overline{AE}$



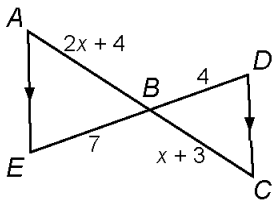
Determine whether each pair of triangles is similar. Justify your answer.

5.



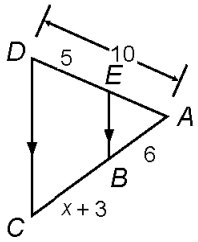
Find x and the measures of the indicated parts.

6.



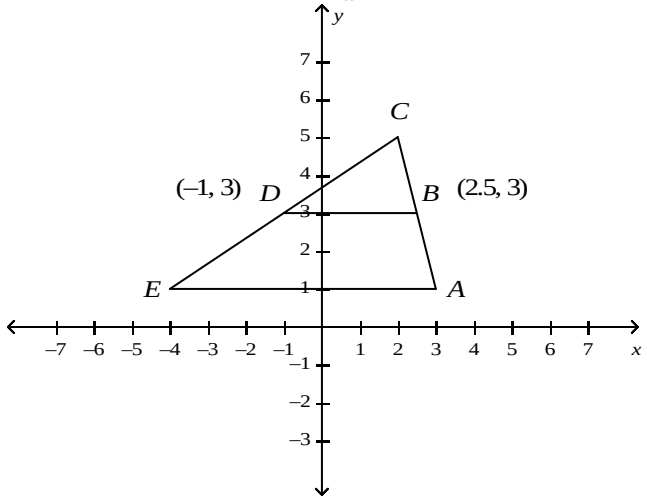
AB and *BC*

7.



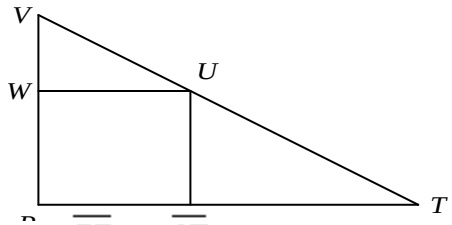
BC and *AC*

8. Find the length of $\overline{AE}$ if $\overline{BD} \parallel \overline{AE}$ and $\overline{BD}$ is a midsegment of $\triangle ACE$.

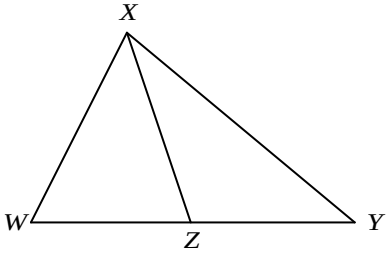


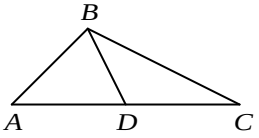
Find the perimeter of the given triangle. Round your answer to the nearest tenth if necessary.

9. $\triangle WUV$, if $\triangle STU \sim \triangle WUV$, given $VW = 4$, $ST = 9$, $SU = 8$, and $TU = 11$.



10. Find WZ if $\triangle ABC \sim \triangle WXY$, $\overline{BD}$ and $\overline{XZ}$ are medians, $BD = 5$, $AD = 4$, $XZ = 3k - 7$, and $WZ = 2k - 2$.



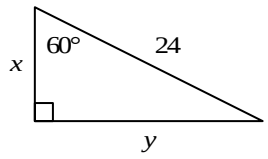


Determine whether $\triangle QRS$ is a right triangle for the given vertices. Explain.

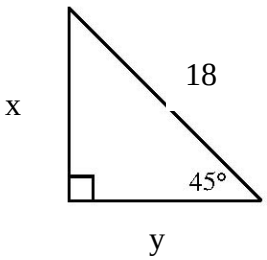
11. $Q(-6, -2)$, $R(2, -5)$, $S(-3, 6)$

12. The length of a diagonal of a square is $24\sqrt{2}$ millimeters. Find the perimeter of the square.

13. Find *x* and *y*.



14. Find x and y



15. Dante is standing at horizontal ground level with the base of the Empire State Building in New York City. The angle formed by the ground and the line segment from his position to the top of the building is 48.4°. The height of the Empire State Building is 1472 feet. Find his distance from the Empire State Building to the nearest foot.

A landscaper is making a retaining wall to shore up the side of a hill. To ensure against collapse, the wall should make an angle 75° or less with the ground.

16. If the wall (from ground level to the top of the hill) is 25 feet long, what is the height of the hill?

17. How far from the base of the hill is the base of a 25-foot slanted wall?

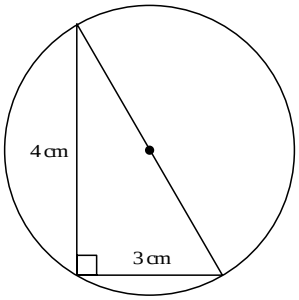
18. A traffic helicopter pilot 60 meters above the road spotted two antique cars. The angles of depression are 10.2° and 8.7°. How far apart are the cars?

19. After flying at an altitude of 500 meters, a hang glider starts to descend when the ground distance from the landing pad is 15 kilometers. What is the angle of depression for this part of the flight?

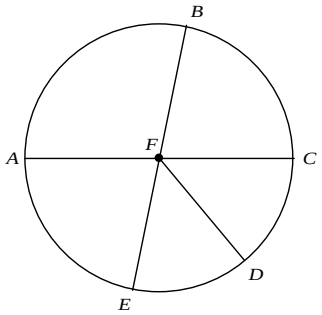
20. Find the measure of an interior angle of a regular hexagon.

21. Find the measure of an exterior angle of a regular decagon.

22. Find the exact circumference of the circle.

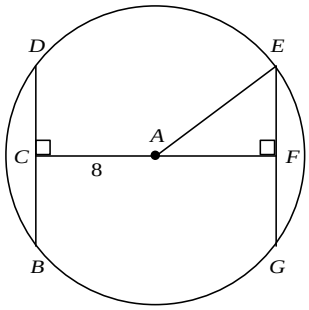


23. In $\odot F$, $\angle CFD \cong \angle DFE$, $m\angle BFA = 7x$, $m\angle AFE = 5x + 12$, and $\overline{BE}$ and $\overline{AC}$ are diameters.



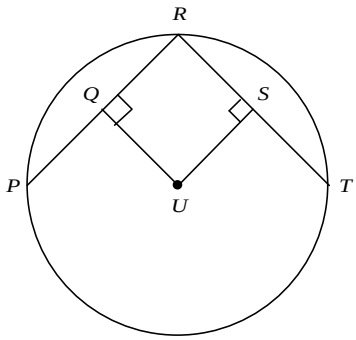
Find m arc DC.

24. In $\odot A$, $\overline{AC} \cong \overline{AF}$ and AE = 10.

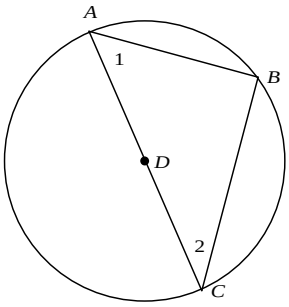


Find $m\overline{EG}$.

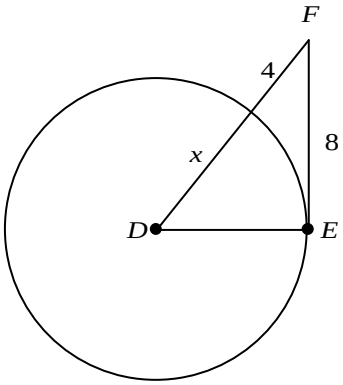
25. In $\odot U$, $TS = 15$, $UQ = US$. Find $m\overline{PR}$.


R
Q
S
P
T
U

26. If $m\angle 1 = 2x + 2$, $m\angle 2 = 9x$, find $m\angle 1$.

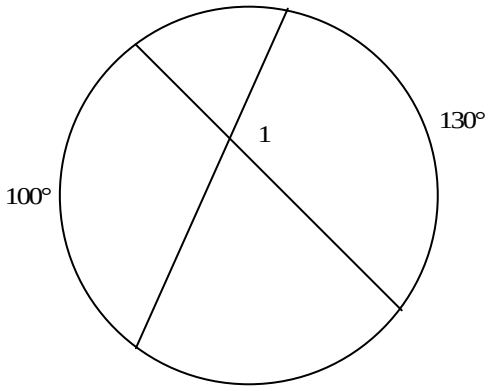


27. Find x. Assume that segments that appear tangent are tangent.

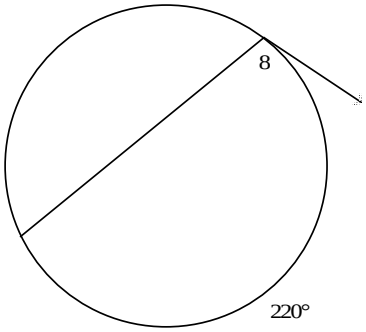


Find the measure of the numbered angle.

28.

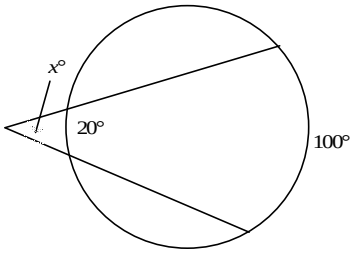


29. *Find the measure of the numbered angle.*

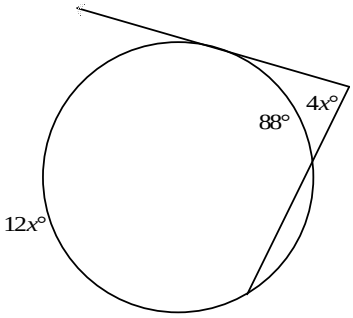


Find x. *Assume that any segment that appears to be tangent is tangent.*

30.

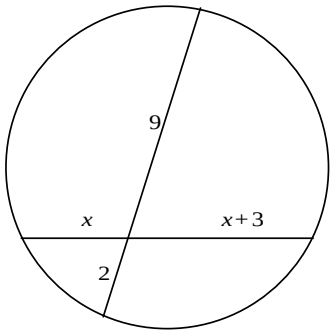


31.



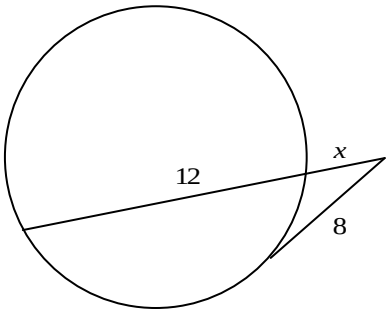
Find x. *Round to the nearest tenth if necessary.*

32.

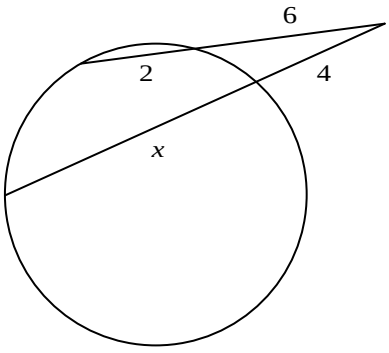


Find x. *Round to the nearest tenth if necessary. Assume that segments that appear to be tangent are tangent.*

33.

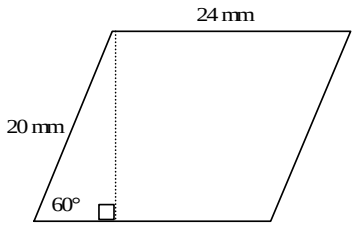


34.



35. Write an equation for a circle with a diameter that has endpoints at (–10, 1) and (–8, 5). Round to the nearest tenth if necessary.

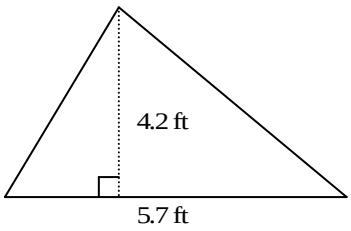
36. Find the perimeter and area of the parallelogram. Round to the nearest tenth if necessary.



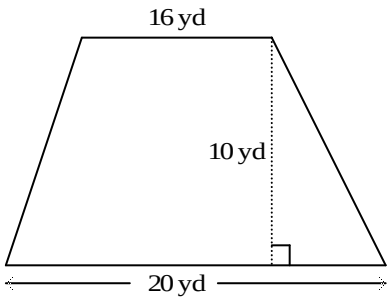
Given the coordinates of the vertices of a quadrilateral, determine whether it is a square, a rectangle, rhombus or a parallelogram. Then find the area of the quadrilateral.

37. $A(0, 0)$, $B(3, 0)$, $C(2, 4)$, $D(5, 4)$

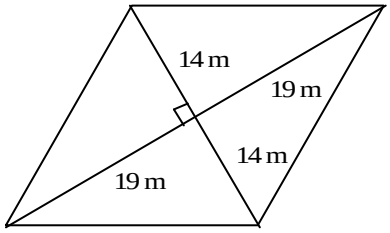
38. Find the area of the figure. Round to the nearest tenth if necessary.



39. Find the area of the figure. Round to the nearest tenth if necessary.



40. Find the area of the figure. Round to the nearest tenth if necessary.

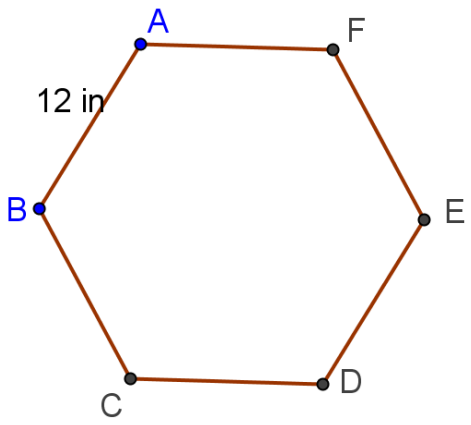


41. Find the area of a regular hexagon with a perimeter of 90 centimeters. Round to the nearest tenth if necessary.

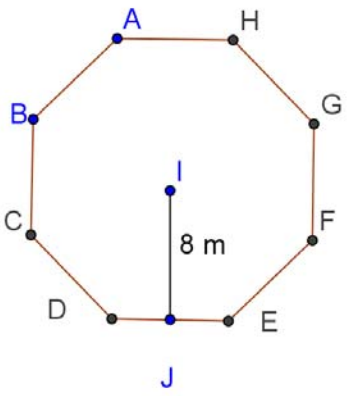
42. Find the area of a circle having a circumference of 34π. Leave in terms of pi.

Find the area of the regular polygon in questions 43 and 44. Round to the nearest tenth if necessary.

43.

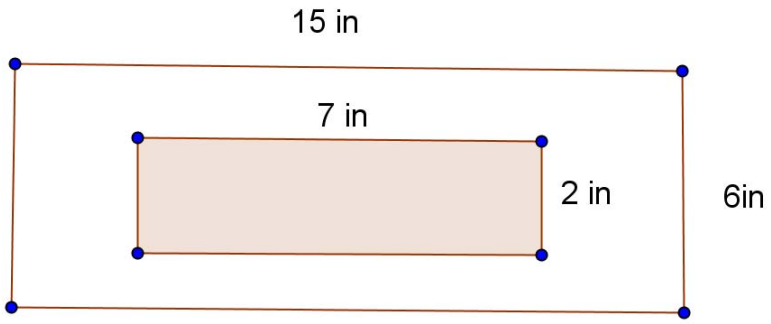


44.



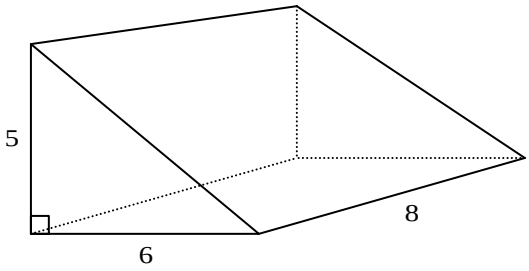
Find the probability that an object will fall in the shaded region in the given region below

45.



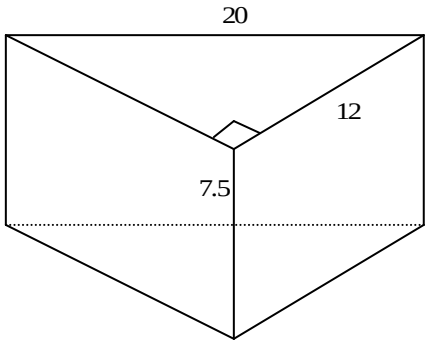
Find the lateral area of each prism. Round to the nearest tenth if necessary.

46.



Find the surface area of each prism. Round to the nearest tenth if necessary while doing your calculations as well as in your final answer.

47.

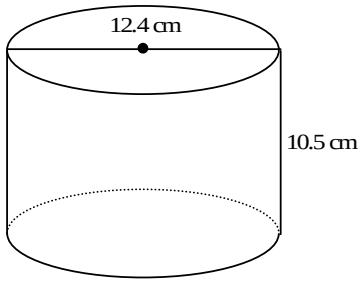


Find the lateral area of a cylinder with the given measurements. Use 3.14 for pi and round your answer to the nearest tenth.

48. height: 18 inches
radius: 9 inches

Find the surface area of the cylinder. Use 3.14 for pi and round your answer to the nearest tenth.

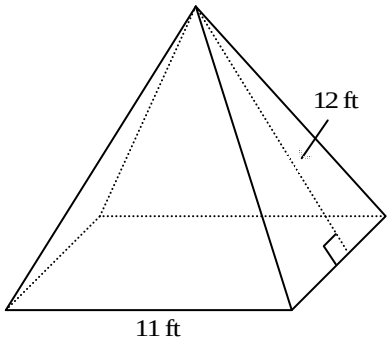
49.



50. Each side of the square base of a regular pyramid is 6.9 feet. The sides rise at an angle of 52°. Find the lateral area of the pyramid. Round to the nearest tenth.

Find the surface area of the regular pyramid. Round to the nearest tenth if necessary.

51.

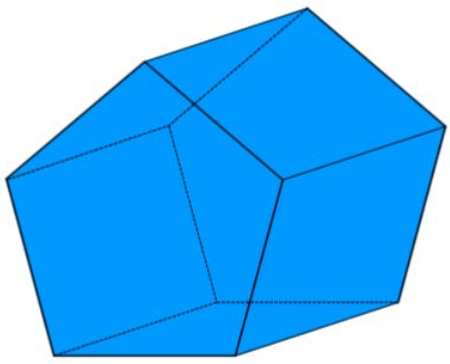


52. Find the lateral area of a cone if the height is 12 meters and the slant height is 16 meters. Use 3.14 for π. Round to the nearest tenth if necessary.

Find the slant height of the cone with the given measurements, rounded to the nearest hundredth. Then use your result to find the surface area of the cone. Use 3.14 for π. Round the final answer to the nearest ten-thousandth.

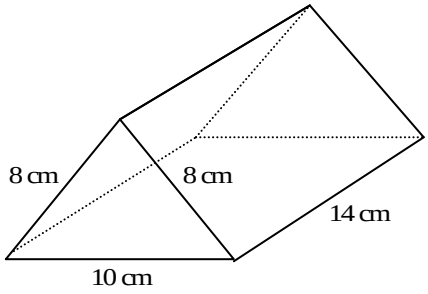
53. height: 17 feet
radius: 13 feet

54. Find Surface area and volume of the regular pentagonal prism below



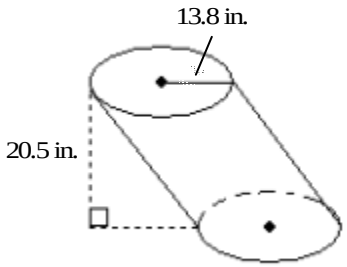
Find the volume of the prism. Round to the nearest tenth if necessary.

55.



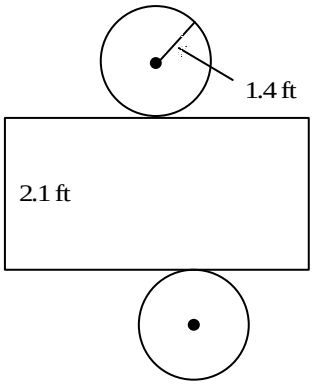
Find the volume of the cylinder. Use 3.14 for π. Round to the nearest tenth.

56.



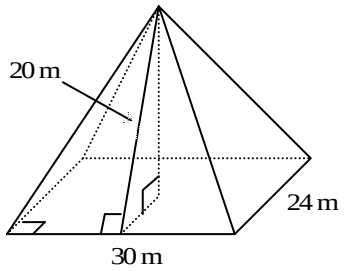
Find the volume of the solid formed by the net. Use 3.14 for π when needed. Round to the nearest tenth.

57.



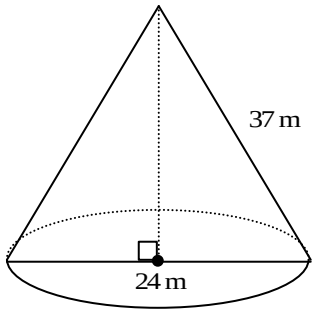
Find the volume of the pyramid. Round to the nearest tenth if necessary.

58.



Find the volume of the cone. Use 3.14 for π. Round to the nearest tenth.

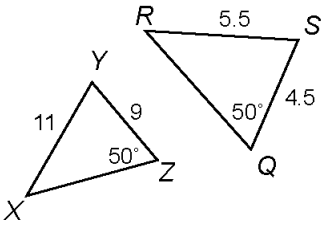
59.



60. Find the volume of a sphere that has a radius of 9.5 meters. Use 3.14 for π. Round to the nearest tenth.

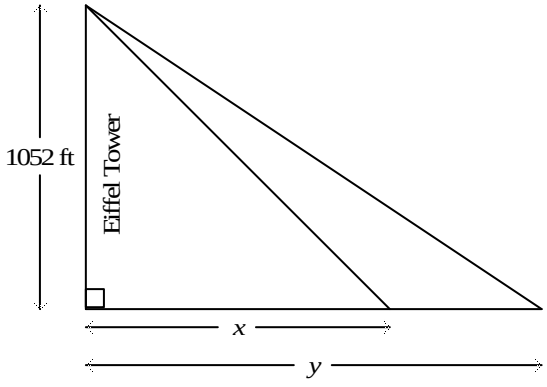
61. Some racquet balls are sold in cylindrical cans of three balls. Each ball has a diameter of 2.25 inches. The can has a diameter of 2.25 inches and is 6.75 inches tall. Find the volume of the empty space in the can. Use 3.14 for π. Round to the nearest hundredth.

62. Are the triangles below similar? Justify your answer.



63. A segment with endpoints *C*(-3, 3)and *D*(7, 3) is the diameter of a circle.
    a. Graph the points and draw the circle.
    b. What is the center of the circle?
    c. What is the length of the radius?
    d. What is the circumference of the circle?
    e. What is the equation of the circle?

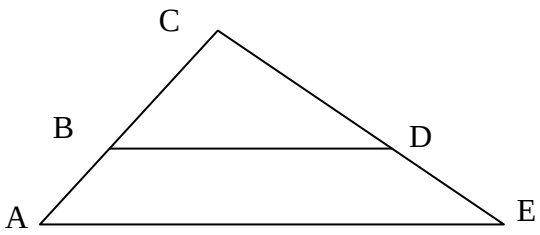
64. The Eiffel Tower in Paris, France, is one of the most famous structures in the world. It was built in the late 1800's and stands 1052 feet tall including its antenna. Use the diagram below to answer the following questions. Round all answers to the nearest foot.



    a. Monique is at a point on the ground that is *x* feet from the base of the tower. If the angle of elevation from that point to the top of the tower is 41°, find the distance *x*.
    b. Pierre is at a point on the ground that is *y* feet from the base of the tower. If the angle of elevation from that point to the top of the tower is 32°, find the distance *y*.
    c. Find the distance on the ground between Monique and Pierre.

Proofs

65. Prove the parallelogram with coordinates A(3,2), B(8,3), C(7,8) and D(2,7) is a rhombus.

66. Given $\overline{\boldsymbol{AE}} \parallel \overline{\boldsymbol{BD}}$

Prove: $\dfrac{\boldsymbol{BD}}{\boldsymbol{AE}} = \dfrac{\boldsymbol{BC}}{\boldsymbol{AC}}$