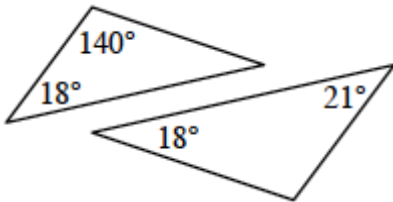


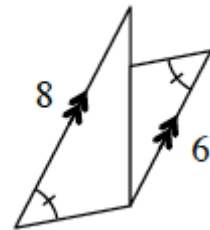
Chapter 6

1. For each pair of triangles below, decide if the pair is similar, congruent or neither. Justify your conclusion with a flowchart or the reasons why the triangles cannot be similar or congruent. Assume that the diagrams are not drawn to scale.

a.

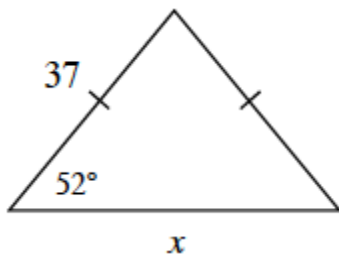


b.

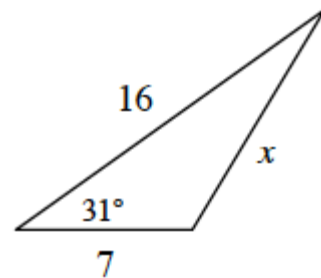


2. Use your triangle tools to solve for x in the triangles below.

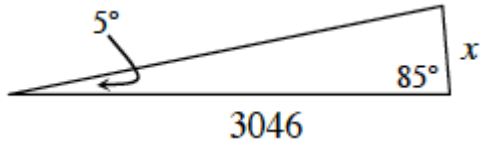
a.



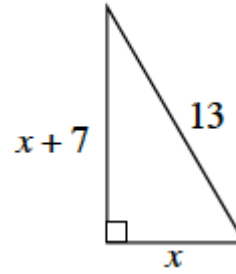
b.



c.

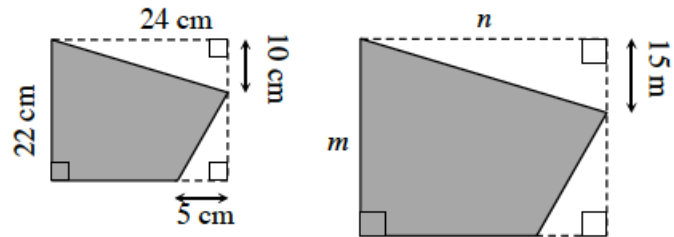


d.



3. The shaded figures below are similar.

a. Solve for m and n .



b. Find the area and perimeter of each figure.

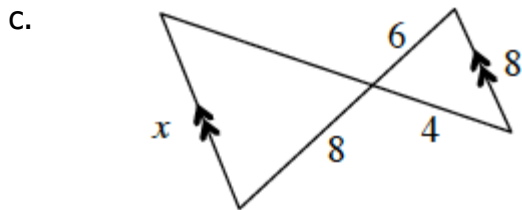
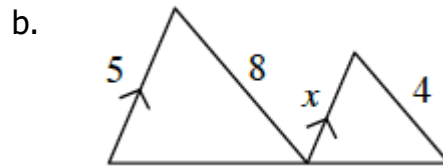
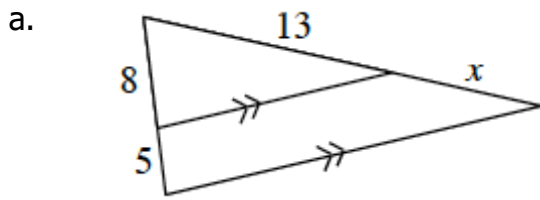
4. Write a converse for each conditional statement below. Then, assuming the original statement is true, decide if the converse must be true or not.

a. If the base angles of a triangle are congruent, then it is isosceles.

b. If a figure is a triangle, then the sum of the angles in the figure is 180° .

c. If I clean my room, then my mom will be happy.

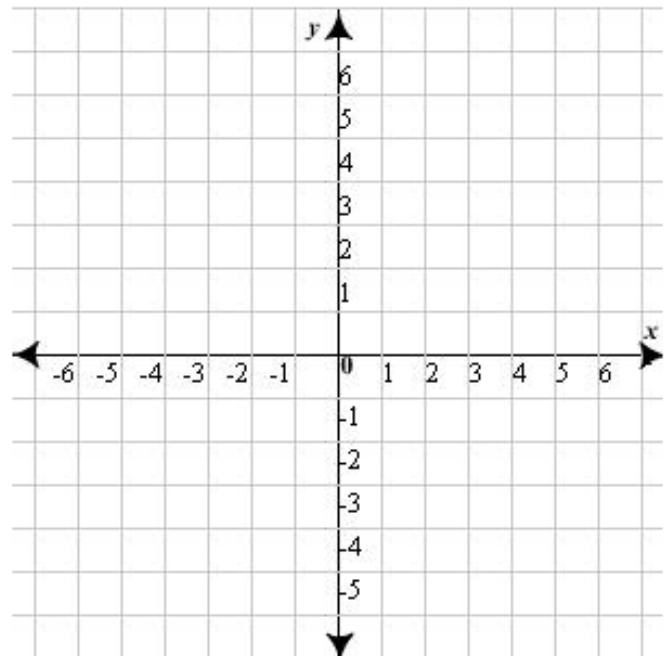
5. For each part below, decide if the triangles are similar. If they are similar, use their similarity to solve for x . If they are not similar, explain why not.



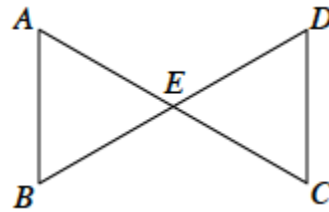
Chapter 7

6. Graph and connect the points $G(-2, 2)$, $H(3, 2)$, $I(6, 6)$, and $J(1, 6)$ to form $GHIJ$.

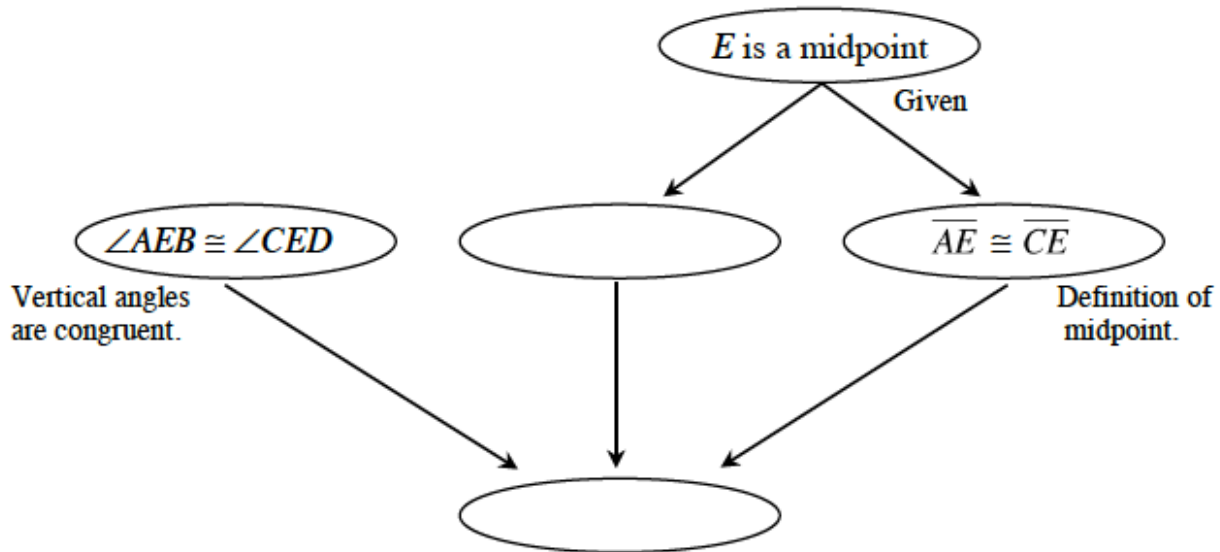
- What specific type of shape is quadrilateral $GHIJ$? Justify your conclusion.
- Find the equations of the diagonals \overline{GI} and \overline{HJ} .
- Compare the slopes of the diagonals. How do the diagonals of a rhombus appear to be related?
- Find J' if quadrilateral $GHIJ$ is rotated 90° clockwise (\curvearrowright) about the origin.
- Find the area of quadrilateral $GHIJ$.



7. Jester started to prove that the triangles below are congruent. He was only told that point E is the midpoint of segments \overline{AC} and \overline{BD} .



Copy and complete his flowchart below.
Be sure that a reason is provided for every statement.



8. Each problem below gives the endpoints of a segment. Find the coordinates of the midpoint of the segment. If you need help, consult the Math Notes box for this lesson.

a. (5, 2) and (11, 14)

b. (3, 8) and (10, 4)

9. MUST BE / COULD BE

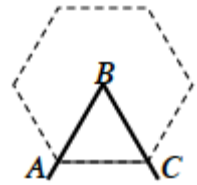
Here are some more challenges from Mr. Quincey. For each description of a quadrilateral below, say what special type the quadrilateral *must be* and/or what special type the quadrilateral *could be*. Look out: Some descriptions may have no *must be* statements, and some descriptions may have many *could be* statements!

a. My quadrilateral has two right angles.

b. The diagonals of my quadrilateral are perpendicular.

10. The angle created by a hinged mirror when forming a regular polygon is called a **central angle**. For example, $\angle ABC$ in the diagram below is the central angle of the regular hexagon.

- a. If the central angle of a regular polygon measures 18° , how many sides does the polygon have?



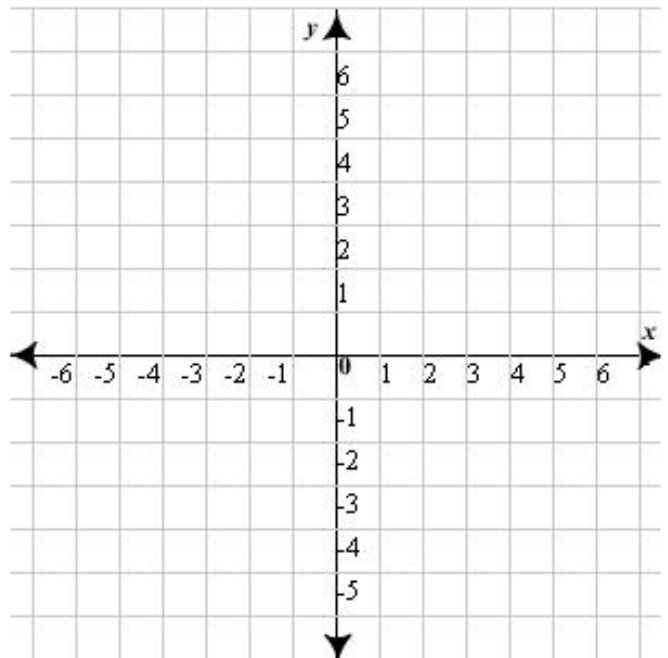
- b. Can a central angle measure 90° ? 180° ? 13° ? For each angle measure, explain how you know.

11. Suppose $ADBC$ is a quadrilateral and the diagonal \overline{AB} lies on $y = -\frac{4}{3}x + 5$ and diagonal \overline{CD} lies on $y = \frac{3}{4}x - 1$. Assume the diagonals intersect at point E .

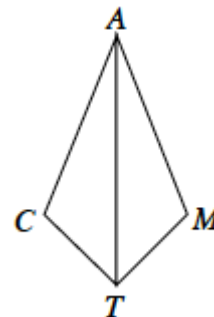
- a. Without graphing, what is the relationship between the diagonals? How do you know?

- b. Graph the lines on graph paper. If E is a midpoint of \overline{CD} , what type of quadrilateral could $ADBC$ be?

Is there more than one possible type? Explain how you know.



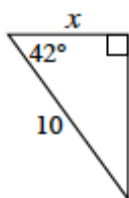
12. Kelly started the proof below to show that if $\overline{TC} \cong \overline{TM}$ and \overline{AT} bisects $\angle CTM$, then $\overline{CA} \cong \overline{MA}$. Copy and complete her proof.



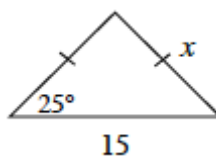
| Statements | Reasons |
|---|--|
| 1. $\overline{TC} \cong \overline{TM}$ and \overline{AT} bisects $\angle CTM$ | |
| 2. | Definition of bisect |
| 3. $\overline{AT} \cong \overline{AT}$ | |
| 4. | |
| 5. | $\cong \Delta s \rightarrow \cong$ parts |

13. For each diagram below, solve for the variable.

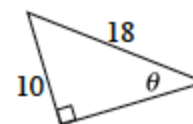
a.



b.



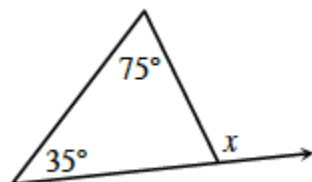
c.



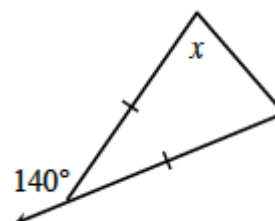
Chapter 8

14. Solve for x in each diagram below.

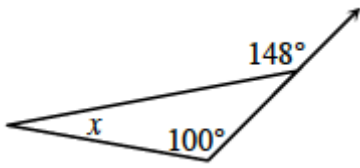
a.



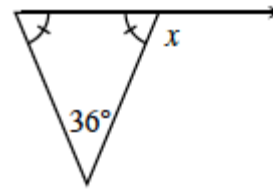
b.



c.



d.



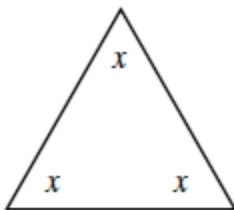
15. The exterior angle of a regular polygon is 20° .

a. What is the measure of an interior angle of this polygon? Show how you know.

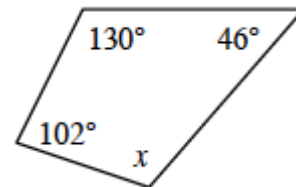
b. How many sides does this polygon have? Show all work.

16. Solve for x in each diagram below.

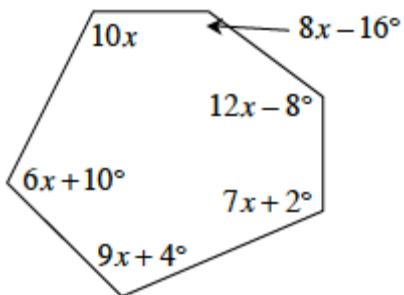
a.



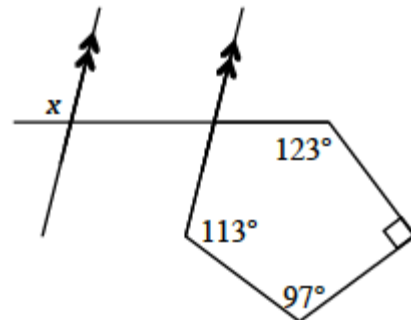
b.



c.



d.



17. Assume Figure A and Figure B , below, are similar.

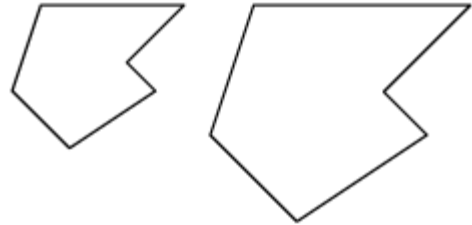


Figure A

Figure B

a. If the ratio of similarity is $\frac{3}{4}$ then what is the ratio of the perimeters of A and B ?

b. If the perimeter of Figure A is p and the linear scale factor is r , what is the perimeter of Figure B ?

c. If the area of Figure A is a and the linear scale factor is r , what is the area of Figure B ?

18. Always a romantic, Marris decided to bake his girlfriend a cookie in the shape of a regular dodecagon (12-gon) for Valentine's Day.

a. If the edge of the dodecagon is 6 cm, what is the area of the top of the cookie?

b. His girlfriend decides to divide the cookie into 12 congruent pieces. After 9 of the pieces have been eaten, what area of the cookie is left?

19. An exterior angle of a regular polygon measures 18° .

a. How many sides does the polygon have?

b. If the length of a side of the polygon is 2 units, what is the area of the polygon?

20. Use what you know about the area and circumference of circles to answer the questions below. Show all work. Leave answers in terms of π .

a. If the radius of a circle is 14 units, what is its circumference? What is its area?

b. If a circle has diameter 10 units, what is its circumference? What is its area?

c. If a circle has circumference 100π units, what is its area?

d. If a circle has circumference C , what is its area in terms of C ?

Chapter 9

21. Assume that two figures on a flat surface, A and B , are similar.

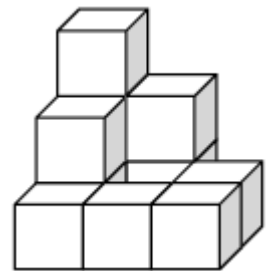
a. If the linear scale factor is $\frac{2}{5}$, then what is the ratio of the areas of A and B ?

b. If the ratio of the perimeters of A and B is 14:1, what is the ratio of the areas?

c. If the area of A is 81 times that of B , what is the ratio of the perimeters?

22. Use the following solid to answer the questions below.

a. Draw the front, right, and top views.



b. Find the total surface area of the solid.

23. Draw a cylinder. Assume the radius of the cylinder is 6 inches and the height is 9 inches.

a. What is the surface area of the cylinder? What is the volume?

b. If the cylinder is enlarged with a linear scale factor of 3, what is the volume of the enlarged cylinder? How do you know?

24. A new car purchased for \$27,000 loses 15% of its value each year.

a. What is the multiplier?

b. Write a function of the form $(f)t = ab^t$ that represents the situation.

c. At the current rate, what will be the value of the car in 5 years?

25. Because students complained that there were not enough choices in the cafeteria, the student council decided to collect data about the sandwich choices that were available. The cafeteria supervisor indicated that she makes 36 sandwiches each day. Each sandwich consists of bread, a protein, and a condiment. Twelve of the sandwiches were made with white bread, and 24 with whole-grain bread. Half of the sandwiches were made with salami, and the other half were evenly split between turkey and ham. Two-thirds of the sandwiches were made with mayonnaise, and the rest were left plain with no condiment.

a. Organize the possible sandwich combinations of bread, protein, and condiment by making an area model or tree diagram, if possible.

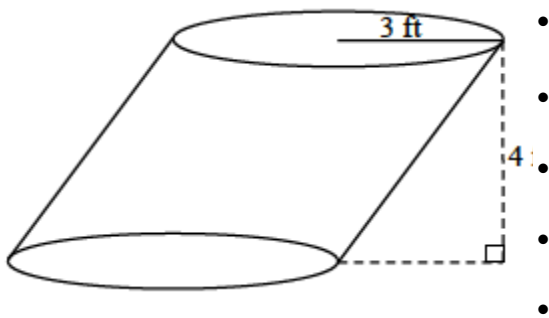
b. Wade likes any sandwich that has salami or mayonnaise on it. Which outcomes are sandwiches that Wade likes? If Wade randomly picks a sandwich, what is the probability he will get a sandwich that he likes?

c. Madison does not like salami or mayonnaise. Which outcomes are sandwiches that Madison likes? If Madison randomly picks a sandwich, what is the probability she will get a sandwich that she likes?

d. If you have not already done so in part (c), show how to use a complement to find the probability Madison gets a sandwich that she likes.

e. Which outcomes are in the event for the intersection of {salami} and {mayonnaise}?

26. Compute the volume of the figure below.



27. West High School has a math building in the shape of a regular polygon. When Mrs. Woods measured an interior angle of the polygon (which was inside her classroom), she got 135° .

a. How many sides does the math building have? Show how you got your answer.

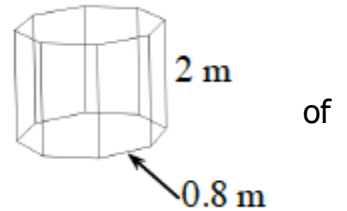
b. If Mrs. Wood's ceiling is 10 feet high and the length of one side of the building is 25 feet, find the volume of West High School's math building.

28. Write the equation of an exponential function that passes through the points (2, 48) and (5, 750).

29. On her paper, Kaye has a line with points A and B on it. Explain how she can use a compass to find a point C so that B is a midpoint of \overline{AC} . If you have access to a compass, try this yourself.

30. A restaurant has a giant fish tank, shown below, in the shape of an octagonal prism.

- a. Find the volume and surface area of the fish tank if the base is a regular octagon with side length 0.8 m and the height of the prism is 2 m.



Chapter 10

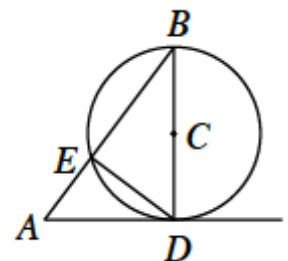
31. a. What is the measure of each interior angle of a regular 20-gon?

- b. Each angle of a regular polygon measures 157.5° . How many sides does this polygon have?

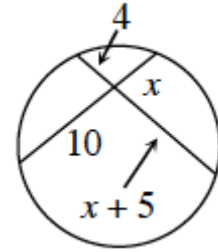
c. Find the area of a regular octagon with sides 5 cm.

32. Assume \overline{AD} is tangent to $\odot C$ at D .

- b. If the radius of $\odot C$ is 10 and the $m\widehat{ED} = 30^\circ$, what is $m\widehat{EB}$? AD ?



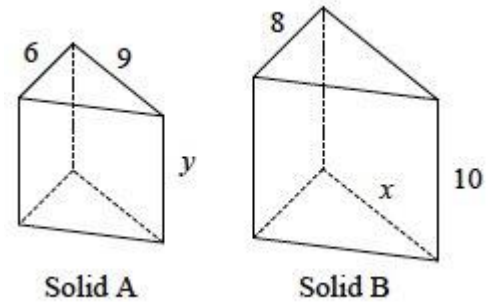
33. A circle has two intersecting chords as shown in the diagram below. Find the value of x .



Chapter 11

34. Assume that the prisms at right are similar.

a. Solve for x and y .



b. What is the ratio of the corresponding sides of Solid B to Solid A?

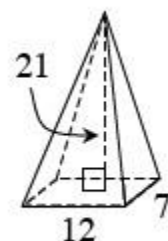
c. If the base area of Solid A is 27 square units, find the base area of Solid B.

35. While volunteering for a food sale, Aimee studied a cylindrical can of soup. She noticed that it had a diameter of 3 inches and a height of 4.5 inches.

a. Find the volume of the soup can.

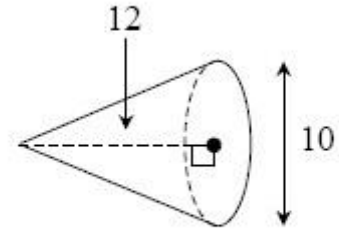
b. If Aimee needs to fill a cylindrical pot that has a diameter of 14 inches and a height of 10 inches, how many cans of soup will she need?

c. What is the area of the soup can label?



36. Calculate the volume of the rectangle-based pyramid at right.

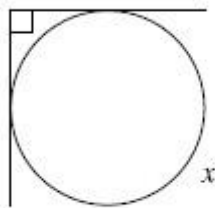
37. Find the volume and total surface area of the following solid. Show all work.



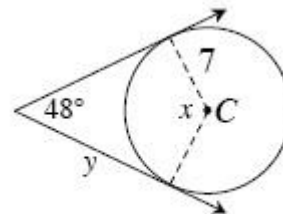
38. As Shannon peeled her orange for lunch, she realized that it was very close to being a sphere. If her orange has a diameter of 8 centimeters, what is its approximate surface area (the area of the orange peel)? What is the approximate volume of the orange? Show all work.

39. Solve for the variables in each of the diagrams below. Assume point C is the center of the circle in part (b).

a.



b.

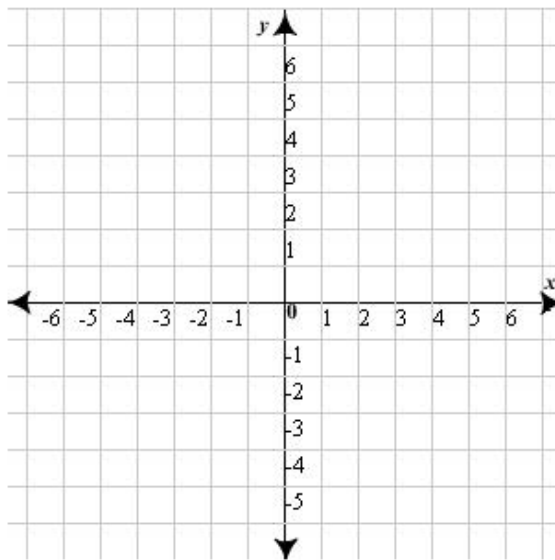


40. Which has greater volume: a cylinder with radius 38 units and height 71 units or a rectangular prism with dimensions 34, 84, and 99 units? Show all work and support your reasoning

41. Find the volume and surface area of a right pyramid if its height is 7 mm and its base is a regular pentagon with perimeter 20 mm.

Chapter 12

42. Graph a circle with center (4, 2) and radius 3 units and write its equation



43. For equation, name the center and radius.

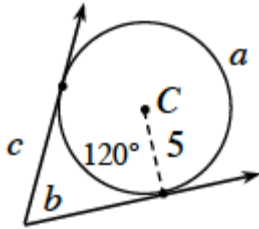
a. $x^2 + y^2 = 4.5^2$

b. $x^2 + y^2 = 75$

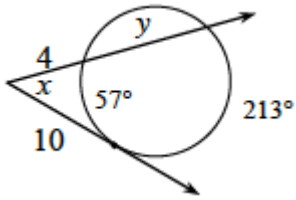
c. $(x - 3)^2 + y^2 = 1$

44. Examine the diagrams below. For each one, use geometric relationships to solve for desired information.

a.



b.



c.

