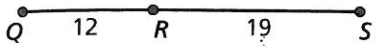
1 Chapter Test

Find the length of $\overline{QS}$. Explain how you found your answer.

1.



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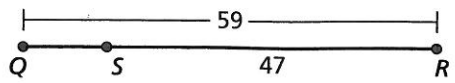


Find the coordinates of the midpoint M. Then find the distance between the two points.

3. $A(-4, -8)$ and $B(-1, 4)$

4. $C(-1, 7)$ and $D(-8, -3)$

5. The midpoint of $\overline{EF}$ is $M(1, -1)$. One endpoint is $E(-3, 2)$. Find the coordinates of endpoint F.

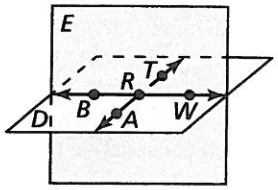
Use the diagram to decide whether the statement is true or false.

6. Points A, R, and B are collinear.

7. $\overleftrightarrow{BW}$ and $\overleftrightarrow{AT}$ are lines.

8. $\overrightarrow{BR}$ and $\overrightarrow{RT}$ are opposite rays.

9. Plane D could also be named plane ART.

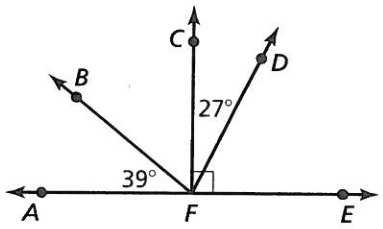


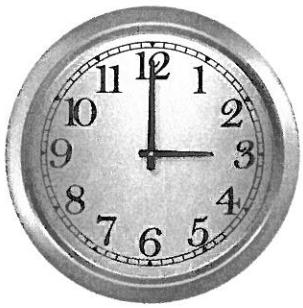
Find the perimeter and area of the polygon with the given vertices. Explain how you found your answer.

10. $P(-3, 4)$, $Q(1, 4)$, $R(-3, -2)$, $S(3, -2)$

11. $J(-1, 3)$, $K(5, 3)$, $L(2, -2)$

12. In the diagram, $\angle AFE$ is a straight angle and $\angle CFE$ is a right angle. Identify all supplementary and complementary angles. Explain. Then find $m\angle DFE$, $m\angle BFC$, and $m\angle BFE$.





13. Use the clock at the left.

a. What is the measure of the acute angle created when the clock is at 10:00?

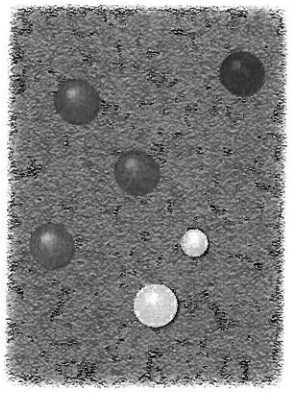
b. What is the measure of the obtuse angle created when the clock is at 5:00?

c. Find a time where the hour and minute hands create a straight angle.

14. Sketch a figure that contains a plane and two lines that intersect the plane at one point.

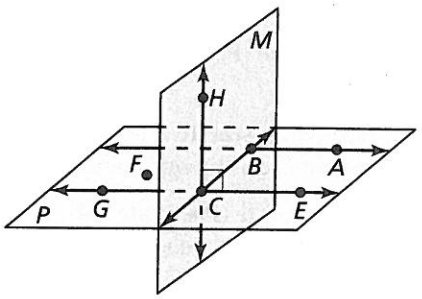
15. Your parents decide they would like to install a rectangular swimming pool in the backyard. There is a 15-foot by 20-foot rectangular area available. Your parents request a 3-foot edge around each side of the pool. Draw a diagram of this situation in a coordinate plane. What is the perimeter and area of the largest swimming pool that will fit?

16. The picture shows the arrangement of balls in a game of boccie. The object of the game is to throw your ball closest to the small, white ball, which is called the *pallino*. The green ball is the midpoint between the red ball and the pallino. The distance between the green ball and the red ball is 10 inches. The distance between the yellow ball and the pallino is 8 inches. Which ball is closer to the pallino, the green ball or the yellow ball? Explain.



2 Chapter Test

Use the diagram to determine whether you can assume the statement. Explain your reasoning.



1. $\overleftrightarrow{AB} \perp$ plane M
2. Points F, G, and A are coplanar.
3. Points E, C, and G are collinear.
4. Planes M and P intersect at $\overleftrightarrow{BC}$.
5. $\overleftrightarrow{FA}$ lies in plane P.
6. $\overleftrightarrow{FG}$ intersects $\overleftrightarrow{AB}$ at point B.

Solve the equation. Justify each step.

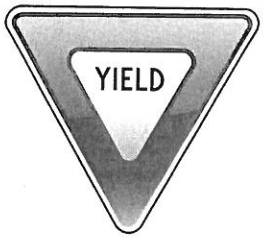
7. $9x + 31 = -23 + 3x$
8. $26 + 2(3x + 11) = -18$
9. $3(7x - 9) - 19x = -15$

Write the if-then form, the converse, the inverse, the contrapositive, and the biconditional of the conditional statement.

10. Two planes intersect at a line.
11. A monkey is a mammal.

Use inductive reasoning to make a conjecture about the given quantity. Then use deductive reasoning to show that the conjecture is true.

12. the sum of three odd integers
13. the product of three even integers
14. Give an example of two statements for which the Law of Detachment does not apply.
15. The formula for the area A of a triangle is $A = \frac{1}{2}bh$, where b is the base and h is the height. Solve the formula for h and justify each step. Then find the height of a standard yield sign when the area is 558 square inches and each side is 36 inches.



16. You visit the zoo and notice the following.
    - The elephants, giraffes, lions, tigers, and zebras are located along a straight walkway.
    - The giraffes are halfway between the elephants and the lions.
    - The tigers are halfway between the lions and the zebras.
    - The lions are halfway between the giraffes and the tigers.

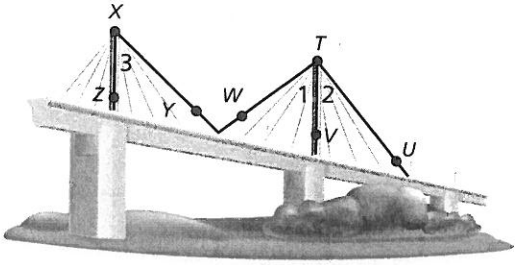
    Draw and label a diagram that represents this information. Then prove that the distance between the elephants and the giraffes is equal to the distance between the tigers and the zebras. Use any proof format.

17. Write a proof using any format.

    Given $\angle 2 \cong \angle 3$

    $\overrightarrow{TV}$ bisects $\angle UTW$.

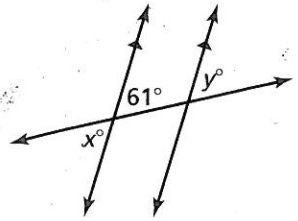
    Prove $\angle 1 \cong \angle 3$



3 Chapter Test

Find the values of x and y. State which theorem(s) you used.

1.



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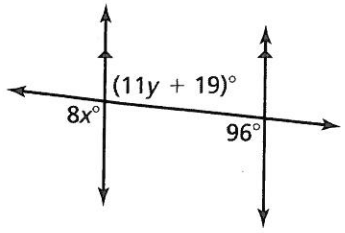

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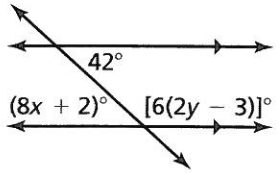


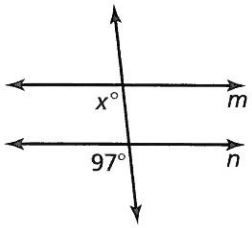
Find the distance from point A to the given line.

4. $A(3, 4), y = -x$

5. $A(-3, 7), y = \frac{1}{3}x - 2$

Find the value of x that makes $m \parallel n$.

6.



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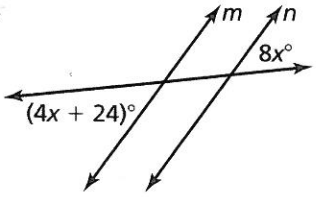
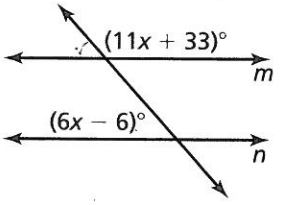


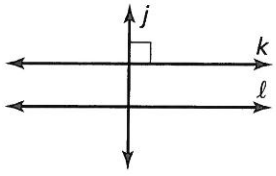
8.



Write an equation of the line that passes through the given point and is (a) parallel to and (b) perpendicular to the given line.

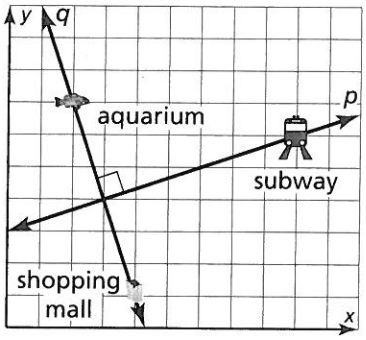
9. $(-5, 2), y = 2x - 3$

10. $(-1, -9), y = -\frac{1}{3}x + 4$



11. A student says, "Because $j \perp k, j \perp \ell$." What missing information is the student assuming from the diagram? Which theorem is the student trying to use?

12. You and your family are visiting some attractions while on vacation. You and your mom visit the shopping mall while your dad and your sister visit the aquarium. You decide to meet at the intersection of lines q and p. Each unit in the coordinate plane corresponds to 50 yards.

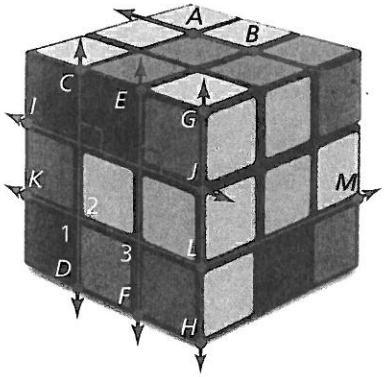


a. Find the equation of line q.

b. Find the equation of line p.

c. What are the coordinates of the meeting point?

d. What is the distance from the meeting point to the subway?



13. Identify an example on the puzzle cube of each description. Explain your reasoning.

a. a pair of skew lines

b. a pair of perpendicular lines

c. a pair of parallel lines

d. a pair of congruent corresponding angles

e. a pair of congruent alternate interior angles

4 Chapter Test

Graph $\triangle RST$ with vertices $R(-4, 1)$, $S(-2, 2)$, and $T(3, -2)$ and its image after the translation.

1. $(x, y) \rightarrow (x - 4, y + 1)$

2. $(x, y) \rightarrow (x + 2, y - 2)$

Graph the polygon with the given vertices and its image after a rotation of the given number of degrees about the origin.

3. $D(-1, -1)$, $E(-3, 2)$, $F(1, 4)$; 270°

4. $J(-1, 1)$, $K(3, 3)$, $L(4, -3)$, $M(0, -2)$; 90°

Determine whether the polygons with the given vertices are congruent or similar. Use transformations to explain your reasoning.

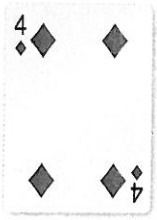
5. $Q(2, 4)$, $R(5, 4)$, $S(6, 2)$, $T(1, 2)$ and $W(6, -12)$, $X(15, -12)$, $Y(18, -6)$, $Z(3, -6)$

6. $A(-6, 6)$, $B(-6, 2)$, $C(-2, -4)$ and $D(9, 7)$, $E(5, 7)$, $F(-1, 3)$

Determine whether the object has line symmetry and whether it has rotational symmetry. Identify all lines of symmetry and angles of rotation that map the figure onto itself.

7. 

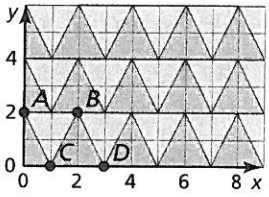
8. 

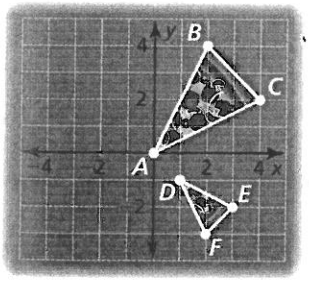
9. 

10. Draw a diagram using a coordinate plane, two parallel lines, and a parallelogram that demonstrates the Reflections in Parallel Lines Theorem (Theorem 4.2).

11. A rectangle with vertices $W(-2, 4)$, $X(2, 4)$, $Y(2, 2)$, and $Z(-2, 2)$ is reflected in the y-axis. Your friend says that the image, rectangle $W'X'Y'Z'$, is exactly the same as the preimage. Is your friend correct? Explain your reasoning.

12. Write a composition of transformations that maps $\triangle ABC$ onto $\triangle CDB$ in the tesselation shown. Is the composition a congruence transformation? Explain your reasoning.





13. There is one slice of a large pizza and one slice of a small pizza in the box.
    a. Describe a similarity transformation that maps pizza slice ABC to pizza slice DEF.
    b. What is one possible scale factor for a medium slice of pizza? Explain your reasoning. (Use a dilation on the large slice of pizza.)

14. The original photograph shown is 4 inches by 6 inches.
    a. What transfomations can you use to produce the new photograph?
    b. You dilate the original photograph by a scale factor of $\frac{1}{2}$. What are the dimensions of the new photograph?
    c. You have a frame that holds photos that are 8.5 inches by 11 inches. Can you dilate the original photograph to fit the frame? Explain your reasoning.

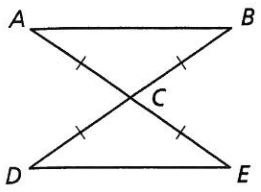
original

new

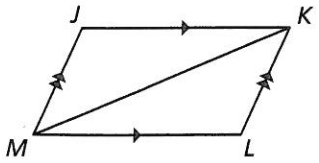
5 Chapter Test

Write a proof.

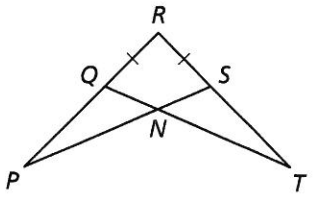
1. **Given** $\overline{CA} \cong \overline{CB} \cong \overline{CD} \cong \overline{CE}$
   Prove $\triangle ABC \cong \triangle EDC$



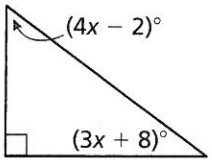
2. **Given** $\overline{JK} \parallel \overline{ML}, \overline{MJ} \parallel \overline{KL}$
   Prove $\triangle MJK \cong \triangle KLM$



3. **Given** $\overline{QR} \cong \overline{RS}, \angle P \cong \angle T$
   Prove $\triangle SRP \cong \triangle QRT$



4. Find the measure of each acute angle in the figure at the right.

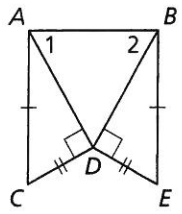


5. Is it possible to draw an equilateral triangle that is not equiangular? If so, provide an example. If not, explain why.

6. Can you use the Third Angles Theorem (Theorem 5.4) to prove that two triangles are congruent? Explain your reasoning.

Write a plan to prove that $\angle 1 \cong \angle 2$.

7.



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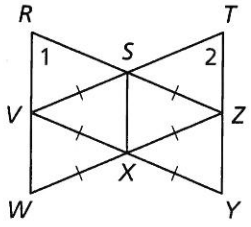
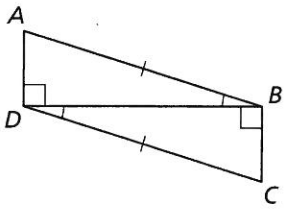
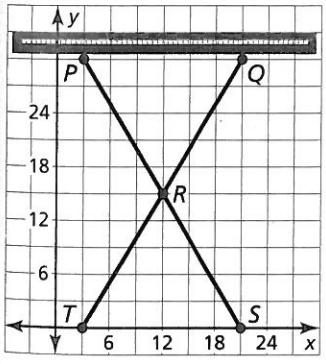


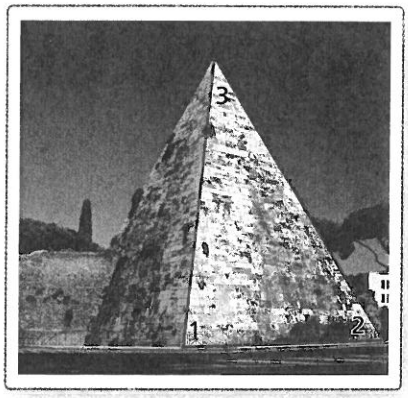
9. Is there more than one theorem that could be used to prove that $\triangle ABD \cong \triangle CDB$? If so, list all possible theorems.





10. Write a coordinate proof to show that the triangles created by the keyboard stand are congruent.

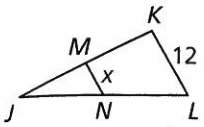
11. The picture shows the Pyramid of Cestius, which is located in Rome, Italy. The measure of the base for the triangle shown is 100 Roman feet. The measures of the other two sides of the triangle are both 144 Roman feet.
    a. Classify the triangle shown by its sides.
    b. The measure of $\angle 3$ is 40°. What are the measures of $\angle 1$ and $\angle 2$? Explain your reasoning.



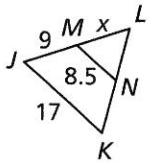
6 Chapter Test

In Exercises 1 and 2, $\overline{MN}$ is a midsegment of $\triangle JKL$. Find the value of x.

1.

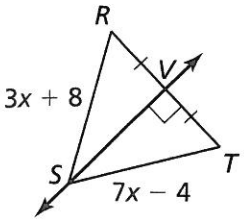


2.

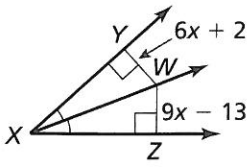


Find the indicated measure. Identify the theorem you use.

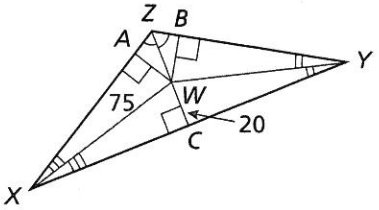
3. ST



4. WY

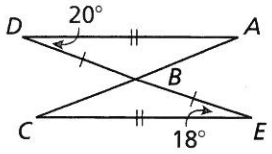


5. BW

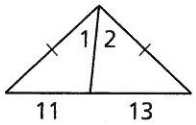


Copy and complete the statement with <, >, or =.

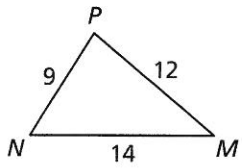
6. AB ___ CB



7. $m\angle 1$ ___ $m\angle 2$



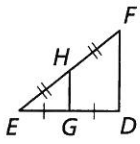
8. $m\angle MNP$ ___ $m\angle NPM$



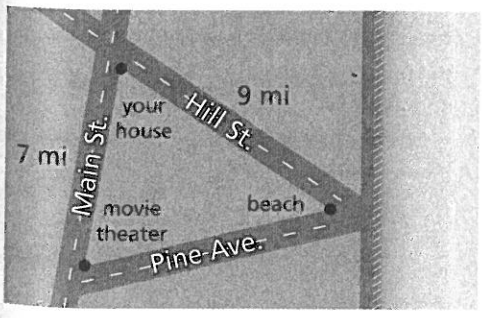
9. Find the coordinates of the circumcenter, orthocenter, and centroid of the triangle with vertices $A(0, -2)$, $B(4, -2)$, and $C(0, 6)$.

10. Write an indirect proof of the Corollary to the Base Angles Theorem (Corollary 5.2): If $\triangle PQR$ is equilateral, then it is equiangular.

11. $\triangle DEF$ is a right triangle with area A. Use the area for $\triangle DEF$ to write an expression for the area of $\triangle GEH$. Justify your answer.



12. Two hikers start at a visitor center. The first hikes 4 miles due west, then turns 40° toward south and hikes 1.8 miles. The second hikes 4 miles due east, then turns 52° toward north and hikes 1.8 miles. Which hiker is farther from the visitor center? Explain how you know.



In Exercises 13–15, use the map.

13. Describe the possible lengths of Pine Avenue.

14. You ride your bike along a trail that represents the shortest distance from the beach to Main Street. You end up exactly halfway between your house and the movie theatre. How long is Pine Avenue? Explain.

15. A market is the same distance from your house, the movie theater, and the beach. Copy the map and locate the market.