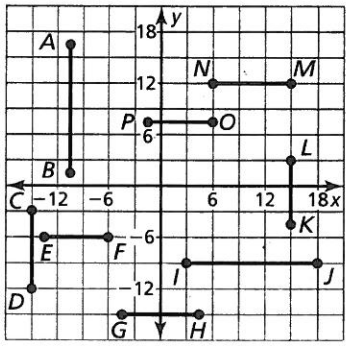
Name AK Date

Chapters 1–3 Cumulative Test

1. Use the diagram to determine which segments, if any, are congruent. List all congruent segments.



$\overline{AB} \cong \overline{IJ}$

$\overline{PO} \cong \overleftrightarrow{LK} \cong \overline{EF}$

$\overline{CD} \cong \overline{NM} \cong \overline{GH}$

2. Which of the following terms are *undefined terms*?

plane segment line point ray

3. A line segment has a midpoint of $\left(2, \frac{3}{2}\right)$ and a length of 15 units. Which choice shows the correct endpoints of the line segment?

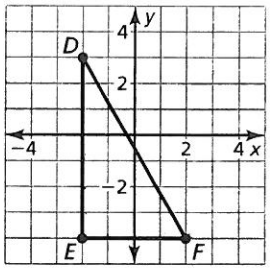
A. (0, 0) and (4, 3) $M = (2, \frac{3}{2})$ $D = 5$

B. (−5, −2) and (7, 7) $M = (1, 5/2)$

C. (−4, −3) and (8, 6) $M = (2, \frac{3}{2})$ $D = 15$

D. (−2, 1) and (6, 2) $M\ (2, 3/2)$

4. Find the perimeter and area of the figure shown.



$P = 11 + \sqrt{65}$

$P \approx 19.06$

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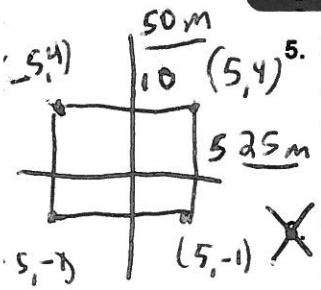
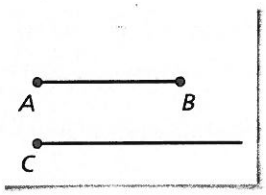
Chapters 1–3 Cumulative Test (continued)

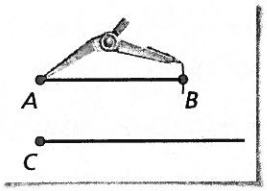


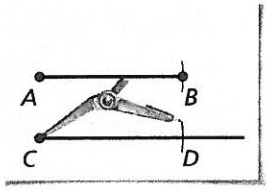
5. Plot the points $A(-5, 4)$, $B(5, 4)$, $C(5, -1)$, and $D(-5, -1)$ in a coordinate plane. What type of polygon do the points form? Your friend claims that you could use this figure to represent a swimming pool with an area of 1250 square meters and a perimeter of 150 meters. Is your friend correct? Explain.

P=30
A=50
IF each unit is 5 meters then
P=150 m
A=1250 m²

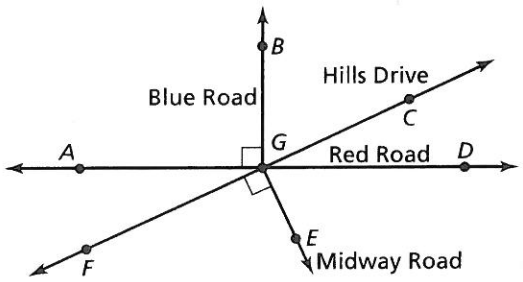
6. Use the steps in the construction to explain how you know that $\overline{CD}$ has the same length as $\overline{AB}$.







7. Four roads come to an intersection point that the people in your town call "Confusion Corner," as shown in the figure.



a. Identify all vertical angles. ∠AGF & ∠CGD

b. Identify all right angles. ∠AGB, ∠FGE

c. Identify all linear pairs. ∠AGB & ∠BGD
∠AGC & ∠CGD
∠FGA & ∠AGC
∠FGB & ∠BGC
∠AGF & ∠FGD
∠AGE & ∠EGD

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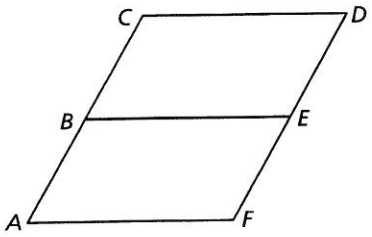
Chapters 1–3 Cumulative Test (continued)

10. Enter the reasons in the correct positions to complete the two-column proof.

Given $\overline{AB} \cong \overline{FE}$, $\overline{AC} \cong \overline{FD}$

Prove $\overline{BC} \cong \overline{ED}$



STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{FE}$	1. Given
2. $AB = FE$	2. B
3. $\overline{AC} \cong \overline{FD}$	3. Given
4. $AC = FD$	4. B
5. $AB + BC = AC$	5. D
6. $FE + BC = FD$	6. C
7. $BC = FD - FE$	7. A
8. $FE + ED = FD$	8. D
9. $ED = FD - FE$	9. A
10. $BC = ED$	10. C
11. $\overline{BC} \cong \overline{ED}$	11. B

A Subtraction Property of Equality

B Definition of congruent segments

C Substitution Property of Equality

D Segment Addition Postulate

11. Find the distance between each pair of points. Then order each line segment from shortest to longest.

a. $A(-5, 2), B(-2, 5)$ $\sqrt{18} = 3\sqrt{2} \approx 4.2$

b. $C(-3, 7), D(3, 7)$ 6

c. $E(1, 4), F(5, -1)$ $\sqrt{41} \approx 6.4$

d. $G(6, 5), H(6, -2)$ 7

e. $J(-3, -6), K(-2, 3)$ $\sqrt{82} \approx 9.1$

f. $L(4, -9), M(6, -7)$ $\sqrt{8} = 2\sqrt{2} \approx 2.8$

F, a, b, c, d, e

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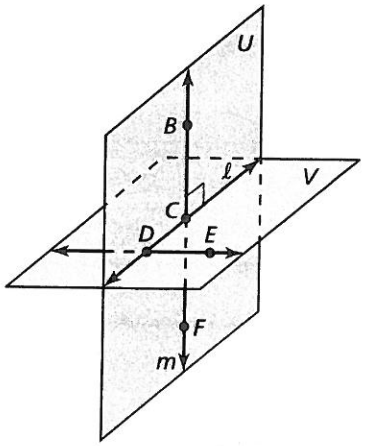
Chapters 1–3 **Cumulative Test (continued)**

8. Use the diagram to write an example of each postulate.



a. Postulate 2.1 Through any two points, there exists exactly one line. $\overleftrightarrow{BC}$ $\overleftrightarrow{CF}$ $\overleftrightarrow{FB}$ $\overleftrightarrow{CD}$

b. Postulate 2.3 If two lines intersect, then their intersection is exactly one point. $\overleftrightarrow{CD}$ & $\overleftrightarrow{ED}$ intersect at D

$\overleftrightarrow{DC}$ & $\overleftrightarrow{FC}$ intersect at C

c. Postulate 2.4 Through any three non-collinear points, there exists exactly one plane. C, D, E are on plane V

B, C, D are on plane U

d. Postulate 2.6 If two points lie in a plane, then the line containing them lies in the plane. $\overleftrightarrow{ED}$ lies in plane V

e. Postulate 2.7 If two planes intersect, then their intersection is a line. planes U & V intersect at line $\overleftrightarrow{CD}$

9. Classify each related conditional statement based on the conditional statement "If Bobby sells five more magazines, then he will be the top seller."

a. If Bobby was the top seller, then he sold five more magazines. converse

b. If Bobby is not the top seller, then he did not sell five more magazines. Contrapositive

c. Bobby is the top seller if and only if he sells five more magazines. Biconditional

d. If Bobby does not sell five more magazines, then he will not be the top seller. inverse

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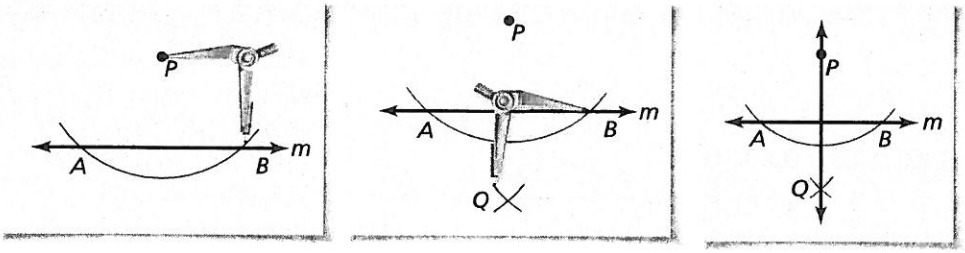
Chapters 1–3 Cumulative Test (continued)

12. Use the steps in the construction to explain how you know that $\overline{PQ}$ is perpendicular to $\overline{AB}$.



13. The equation of a line is $x + 3y = 12$. → $3y = -x + 12$, $\frac{3y}{3} = \frac{-x}{3} + \frac{12}{3}$, $y = -\frac{1}{3}x + 4$

a. Use the numbers and symbols to create the equation of a line in slope-intercept form that passes through the point $(-3, 1)$ and is parallel to the given line.

$y - 1 = -\frac{1}{3}(x + 3)$

$y - 1 = -\frac{1}{3}x - 1$

$y = -\frac{1}{3}x$

b. Use the numbers and symbols to create the equation of a line in slope-intercept form that passes through the point $(4, -2)$ and is perpendicular to the given line. →

$y + 2 = 3(x - 4)$

$y + 2 = 3x - 12$

$y = 3x - 14$

x	y	=	+	−	−14	−2

−1	$-\frac{2}{3}$	$-\frac{1}{3}$	1	2	3	10

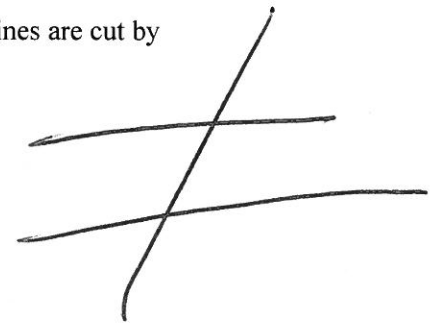
14. Which of the following proves that two lines are parallel when the lines are cut by a transversal? Select all that apply.

A. Alternate interior angles are congruent. ✓

B. Vertical angles are congruent. ✗

C. Consecutive interior angles are supplementary. ✓

D. Alternate exterior angles are congruent. ✓



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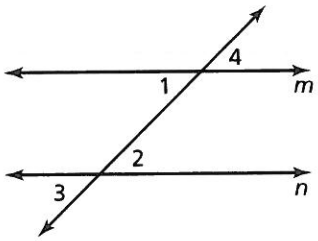
Chapters 1–3

Cumulative Test (continued)

15. Enter the reasons in the correct positions to complete the two-column proof.

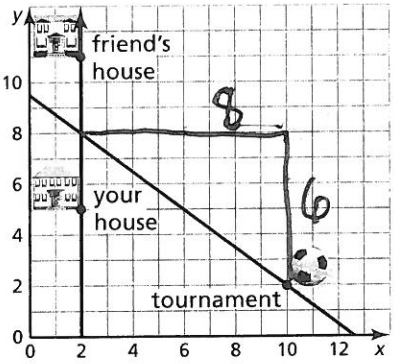


Given $\angle 1 \cong \angle 2$, $m \parallel n$

Prove $\angle 3 \cong \angle 4$

STATEMENTS	REASONS
1. $m \parallel n$	1. Given
2. $\angle 1 \cong \angle 2$	2. Given
3. $\angle 1 \cong \angle 4$	3. Vertical Angles Theorem
4. $\angle 2 \cong \angle 3$	4. Vertical Angles Theorem
5. $\angle 4 \cong \angle 3$	5. Substitution Property of Equality
6. $\angle 3 \cong \angle 4$	6. Symmetric Property

16. You and your friend carpool to the soccer tournament. You meet at the halfway point between your houses first and then drive to the tournament. Each unit in the coordinate plane corresponds to 5 miles.



a. What are the coordinates of the midpoint of the line segment joining the two houses? (2, 8)

b. What is the distance that the two of you drive together?

10 units
× 5 miles

50 miles

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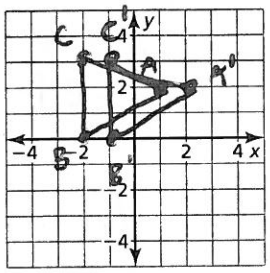
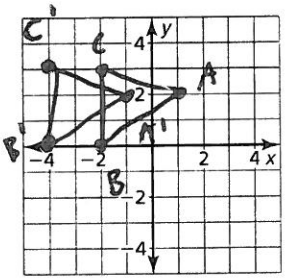
Chapter 4 Test A

Graph $\triangle ABC$ with vertices $A(1, 2)$, $B(-2, 0)$, and $C(-2, 3)$ and its image after the translation.

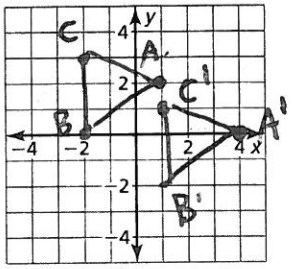
1. $(x, y) \rightarrow (x + 1, y)$



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

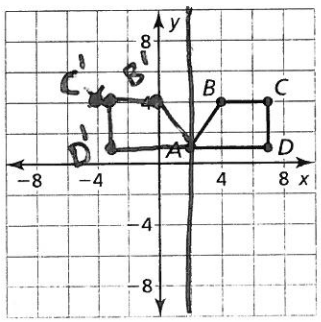


3. $(x, y) \rightarrow (x + 3, y - 2)$

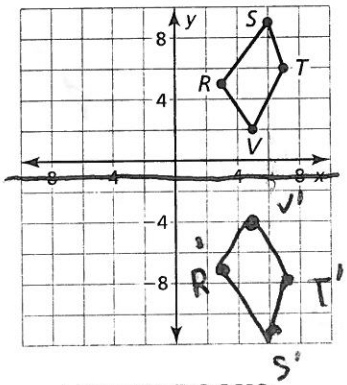


Graph the polygon's image after a reflection in the given line.

4. $x = 2$

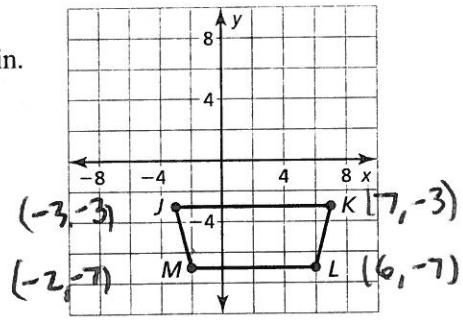


5. $y = -1$



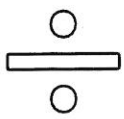
6. Identify the line symmetry (if any) of the word ~~CHECKBOOK?~~

7. Trapezoid $JKLM$ is rotated 180° clockwise about the origin. What are the new coordinates of $J'K'L'M'$?



Determine whether the figure has rotational symmetry. If so, describe any rotations that map the figure onto itself.

8.



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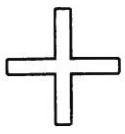
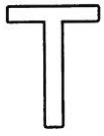


10.



Answers

1. See left.
2. See left.
3. See left.
4. See left.
5. See left.
6. Horizontal Line
7. K'(-7,3) L'(-6,7) M'(2,7) J'(3,3)
8. 180°
9. 90° 180° 270°
10. None

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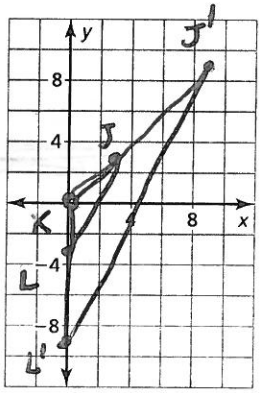
Chapter 4 **Test A** (continued)

Determine whether the polygons with the given verticies are congruent. Use transformations to explain your reasoining.

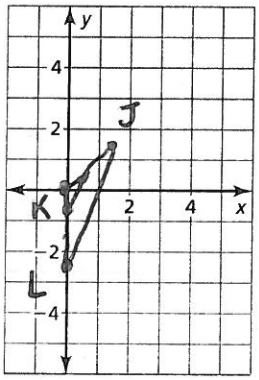
11. $A(8, -6)$, $B(1, -3)$, $C(1, -9)$ and $D(-7, 1)$, $E(0, -2)$, $F(0, 4)$
A'(-8,6) B'(-1,3) C'(-1,9)
12. $J(-4, 1)$, $K(-10, 3)$, $L(-10, 9)$, $M(-4, 7)$, and $N(4, 2)$, $O(2, -8)$, $P(-4, -8)$, $Q(-2, 2)$

Graph $\triangle JKL$ with vertices $J(3, 3)$, $K(0, 0)$, and $L(0, -3)$ and its image after a dilation with scale factor k.

13. $k = 3$



14. $k = \frac{1}{3}$



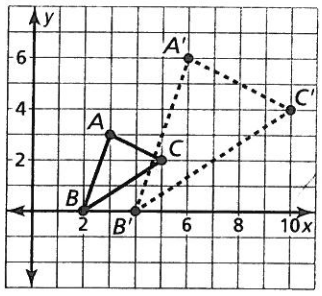
LC = 80°

15. $\triangle ABC$ has $m\angle A = 40°$ and $m\angle B = 60°$. $\triangle DEF$ has $m\angle D = 40°$ and $m\angle F = 80°$. Your partner concludes that the triangles are not similar. Do you agree or disagree? Why?

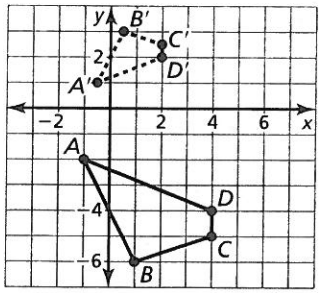
LE = 60°

Describe a similarity transformation that maps the preimage to the image.

16.



17.



Answers

11. Rot 180° & (x, y) → (x+1, y-5) Maps ABC to DEF.
12. Not Congruent
13. See left.
14. See left.
15. Yes because they have the same angle Measures
16. Dilation by k=2
17. Dilation by k=1/2, reflect over X axis.