

Practice 9-1

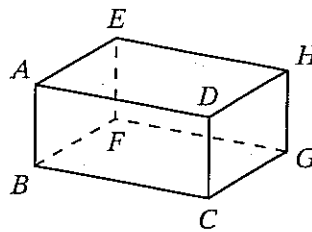
Introduction to Geometry: Points, Lines, and Planes

Use the figures at the right. Name each of the following.

1. Four segments that intersect \overline{AB} .

2. Three segments parallel to \overline{AB} .

3. Four segments skew to \overline{AB} .



Use the figure at the right. Find each of the following.

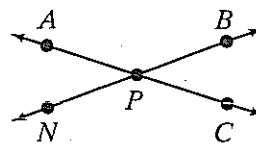
4. all points shown

5. all segments shown

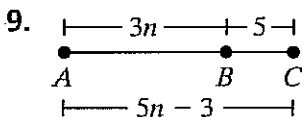
6. five different rays

7. all lines shown

8. all names for \overleftrightarrow{NB}



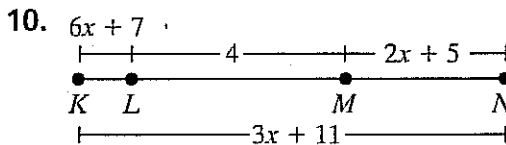
Write an equation. Then find the length of each segment.



equation:

$n =$ _____

$AB =$ _____ $AC =$ _____



equation:

$x =$ _____

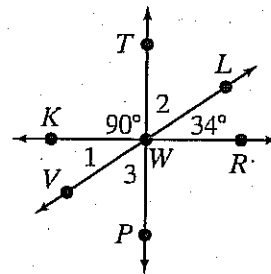
$MN =$ _____ $KN =$ _____

Practice 9-2

Angle Relationships and Parallel Lines

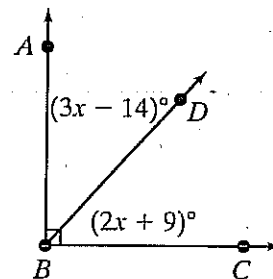
Find the measure of each angle in the figure at the right.

1. $m\angle 1$ _____ 2. $m\angle 2$ _____
 3. $m\angle 3$ _____ 4. $m\angle VWR$ _____



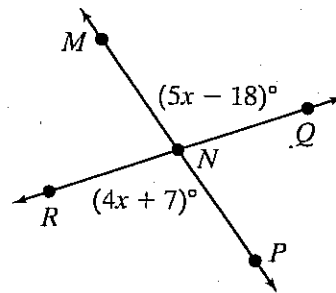
Use the figure at the right for Exercises 5-8.

5. Write an equation. _____
 6. Find the value of x . _____
 7. Find $m\angle ABD$. _____
 8. Find $m\angle DBC$. _____



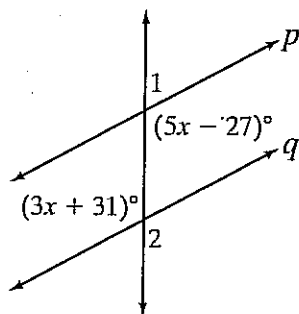
Use the figure at the right for Exercises 9-12.

9. Write an equation. _____
 10. Find the value of x . _____
 11. Find $m\angle MNQ$. _____
 12. Find $m\angle MNR$. _____

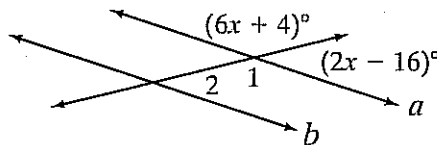


In each figure, find the measures of $\angle 1$ and $\angle 2$.

13. Given $p \parallel q$.



14. Given $a \parallel b$.



$m\angle 1 =$ _____ $m\angle 2 =$ _____ $m\angle 1 =$ _____ $m\angle 2 =$ _____

15. Find a pair of complementary angles such that the difference of their measures is 12° .

All rights reserved.

© Pearson Education, Inc., publishing as Pearson Prentice Hall.

Practice 9-3

Classifying Polygons

Name all quadrilaterals that have each of the named properties.

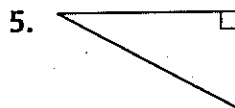
1. four 90° angles

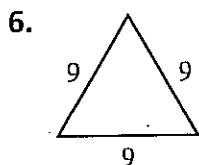
2. opposite sides congruent and parallel

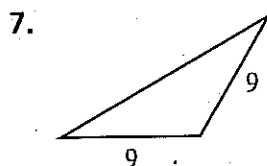
3. at least one pair of parallel sides

Judging by appearances, classify each triangle by its sides and angles.









Write a formula to find the perimeter of each figure. Use the formula to find the perimeter.

8. a regular dodecagon (12-gon); one side is 9.25 cm

$P =$ _____ $P =$ _____

9. a rhombus; one side is $1\frac{3}{4}$ yd

$P =$ _____ $P =$ _____

10. a parallelogram; the sides are 10.4 m and 5.6 m

$P =$ _____ $P =$ _____

Practice 9-4

Draw a Diagram

Solve by drawing a diagram.

1. How many diagonals does a quadrilateral have?

2. Which quadrilaterals always have congruent diagonals?

3. Find a formula for the number of diagonals d in a polygon with n sides. Complete the table to help you. Look for a pattern.

Figure	Number of sides	Number of vertices	Number of diagonals from each vertex	Total number of diagonals
triangle	3			
quadrilateral	4			
pentagon	5			
hexagon	6			
octagon	8			
n -gon	n			

$d =$ _____

4. One day in the lunch line, Maurice was ahead of Aquia and behind Rochelle. Rochelle was ahead of Shequille and behind Whitney. Shequille was ahead of Maurice. Who was last?

5. A mail carrier leaves the post office at 10:00 A.M. and travels 4 miles south, then 7 miles east, then 5 miles south, then 10 miles west, and 9 miles north. At the end of her route, how far and in which direction is the mail carrier from the post office?

All rights reserved.

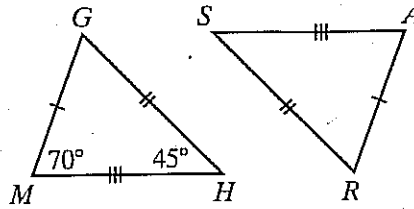
© Pearson Education, Inc., publishing as Pearson Prentice Hall.

Practice 9-5

Congruence

Given that $\triangle GHM \cong \triangle RSA$, complete the following.

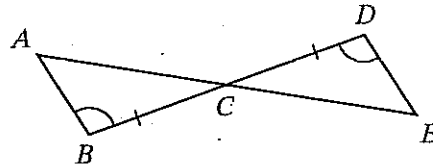
- | | |
|--------------------------------|--------------------------------|
| 1. $\overline{GH} \cong$ _____ | 2. $\overline{AS} \cong$ _____ |
| 3. $\angle S \cong$ _____ | 4. $\angle M \cong$ _____ |
| 5. $\overline{AR} \cong$ _____ | 6. $\angle R \cong$ _____ |
| 7. $m\angle A =$ _____ | 8. $m\angle G =$ _____ |



List the congruent corresponding parts of each pair of triangles. Write a congruence statement for the triangles.

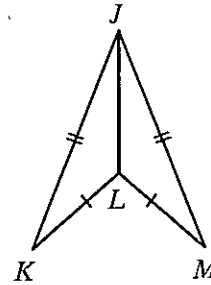
9. _____

 _____ by _____



10. _____

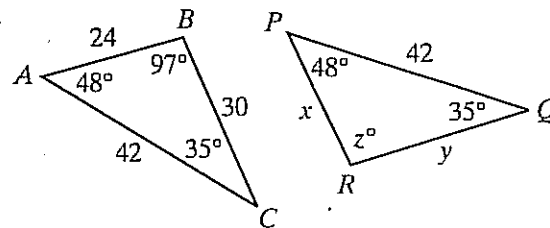
 _____ by _____



Given that $\triangle HPKT \cong \triangle BEWL$, complete the following.

- | | | |
|---------------------------------|---------------------------------|------------------------------|
| 11. $\overline{PK} \cong$ _____ | 12. $\angle L \cong$ _____ | 13. $\angle KPH \cong$ _____ |
| 14. $\overline{LB} \cong$ _____ | 15. $\overline{EB} \cong$ _____ | 16. $\angle PHT \cong$ _____ |

17. Explain why the pair of triangles is congruent. Then, find the missing measures.



Practice 9-6

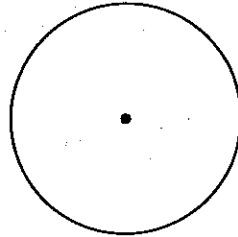
Circles

Find the measures of the central angles that you would draw to represent each percent in a circle graph. Round to the nearest degree.

Voter Preference for Senator		Central Angle
1. Peterson	40%	
2. Washington	30%	
3. Gomez	15%	
4. Thomson	10%	
5. Miller	5%	

6. Draw a circle graph for the data on voter preference.

Voter Preference for Senator



7. The total number of voters surveyed was 5,000. How many voters preferred Gomez?

Find the circumference of each circle with the given radius or diameter. Use 3.14 for π .

8. $d = 25.8$ m
 $C =$ _____

9. $r = 9.1$ cm
 $C =$ _____

10. $r = 0.28$ km
 $C =$ _____

11. $d = 14$ ft
 $C =$ _____

12. $d = 5$ in.
 $C =$ _____

13. $r = \frac{7}{8}$ in.
 $C =$ _____

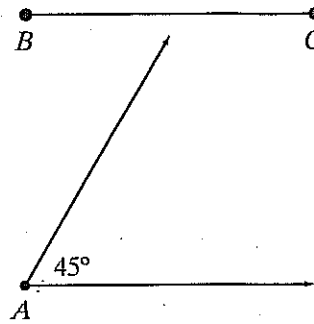
All rights reserved.

© Pearson Education, Inc., publishing as Pearson Prentice Hall.

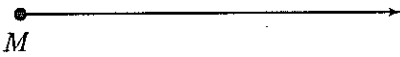
Practice 9-7

Constructions

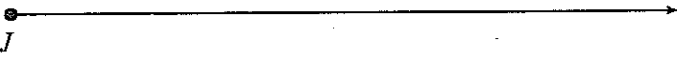
Construct each figure using the diagram at the right.



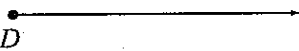
1. \overline{MP} congruent to \overline{BC}



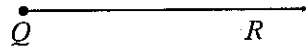
2. \overline{JK} twice as long as \overline{BC}



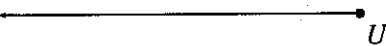
3. $\angle D$ congruent to $\angle A$



4. $\angle PQR$ half the measure of $\angle A$



5. $\angle STU$ with measure 135°



6. \overline{EF} half as long as \overline{BC}



7. Construct $\triangle WXY$ so that $\angle W$ is congruent to $\angle A$, \overline{WY} is congruent to \overline{BC} , and $\angle Y$ is half the measure of $\angle A$.
8. What seems to be true about $\angle X$ in $\triangle WXY$ you constructed?
- _____

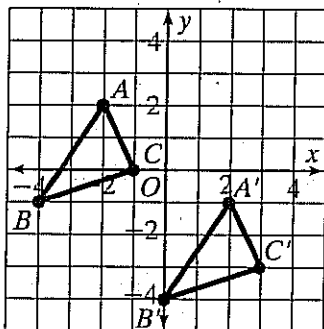


Practice 9-8

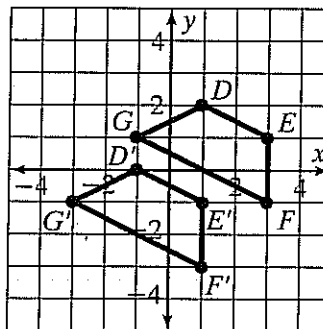
Translations

Write a rule to describe each translation.

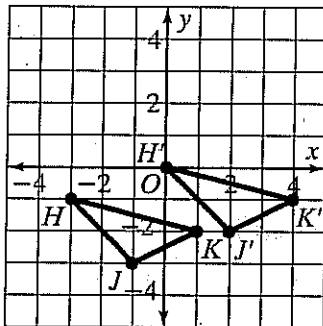
1. $(x, y) \rightarrow$ _____



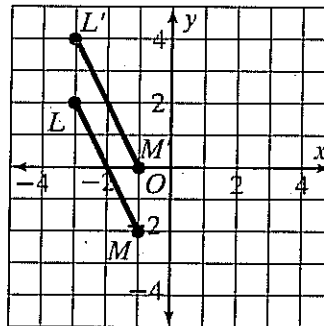
2. $(x, y) \rightarrow$ _____



3. $(x, y) \rightarrow$ _____

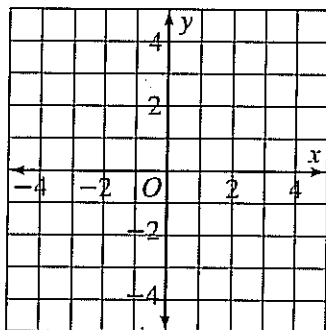


4. $(x, y) \rightarrow$ _____

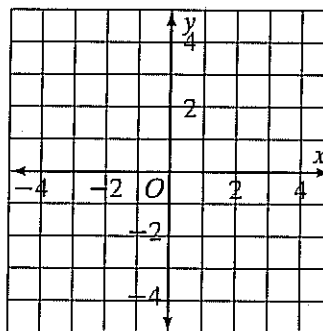


The vertices of a triangle and a translation are given. Graph each triangle and its image.

5. $G(-4, 4), H(-2, 3), J(-3, 0)$; right 5 and down 2



6. $K(0, -1), L(4, 2), M(3, -3)$; left 4 units and up 3 units



A point and its image after a translation are given. Write a rule to describe the translation.

7. $A(9, -4), A'(2, -1)$ $(x, y) \rightarrow$ _____

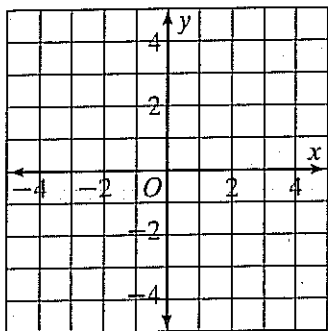
8. $B(-3, 5), B'(-5, -3)$ $(x, y) \rightarrow$ _____

Practice 9-9

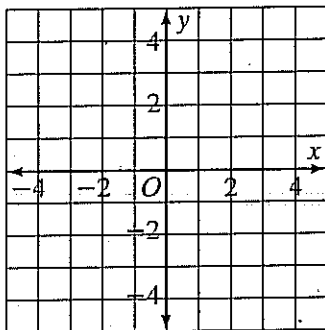
Symmetry and Reflections

The vertices of a polygon are listed. Graph each polygon and its image after a reflection over the given line. Name the coordinates of the image.

1. $A(1, 3), B(4, 1), C(3, -2), D(2, -4); x = 0$



2. $J(-2, 1), K(1, 3), L(4, 2); y = -1$



A' _____ B' _____

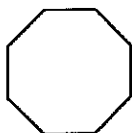
J' _____ K' _____

C' _____ D' _____

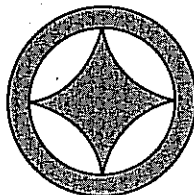
L' _____

Draw all the lines of symmetry for each figure.

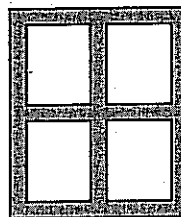
3.



4.

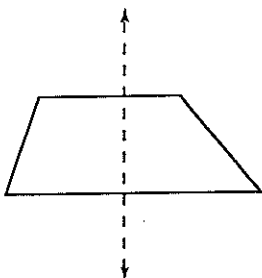


5.

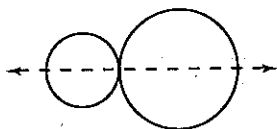


Is the dashed line a line of symmetry? Write yes or no.

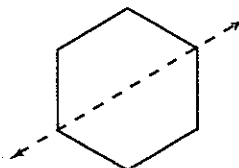
6. _____



7. _____



8. _____

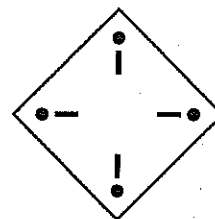
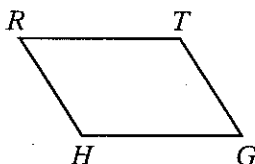
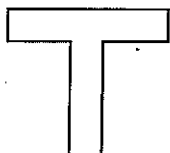


Practice 9-10

Rotations

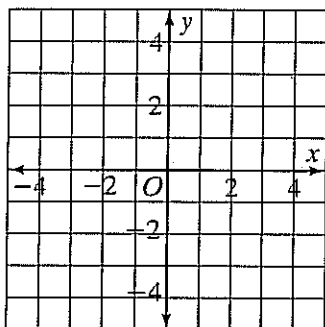
Judging from appearances, does each figure have rotational symmetry? If yes, what is the angle of rotation?

1. _____ 2. _____ 3. _____



The vertices of a triangle are given. Graph each triangle and its image after a rotation of (a) 90° and (b) 180° about the origin. Name the coordinates of the vertices of the images.

4. $A(1, 4), B(1, 1), C(4, 2)$



90°

180°

A' _____

A'' _____

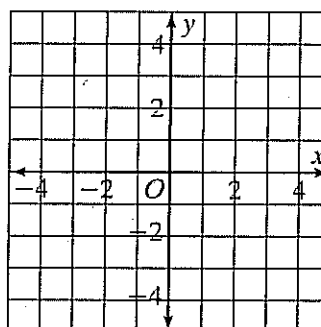
B' _____

B'' _____

C' _____

C'' _____

5. $S(2, 3), T(-2, 4), U(-4, 2)$



90°

180°

S' _____

S'' _____

T' _____

T'' _____

U' _____

U'' _____

Look for a pattern in Exercises 4 and 5 to complete the following.

6. In a 90° rotation, $(x, y) \rightarrow$ _____

7. In a 180° rotation, $(x, y) \rightarrow$ _____

Chapter 9 Answers

Practice 9-1

- $\overline{BC}, \overline{BF}, \overline{AE}, \overline{AD}$
- $\overline{DC}, \overline{EF}, \overline{GH}$
- $\overline{DH}, \overline{FG}, \overline{EH}, \overline{CG}$
- A, B, C, P, N
- $\overline{AP}, \overline{PC}, \overline{AC}, \overline{NP}, \overline{PB}, \overline{NB}$
- $\overline{PA}, \overline{PC}, \overline{PB}, \overline{PN}, \overline{NB}$
- $\overline{AC}, \overline{NB}$
- $\overline{NB}, \overline{BN}, \overline{PN}, \overline{NP}, \overline{BP}, \overline{PB}$
- $3n + 5 = 5n - 3, 4, 12, 17$
- $6x + 7 + 4 + 2x + 5 = 3x + 11, -1, 3, 8$

Practice 9-2

- 34°
- 56°
- 56°
- 146°
- $(3x - 14) + (2x + 9) = 90$
- $x = 19$
- 43°
- 47°
- $5x - 18 = 4x + 7$
- $x = 25$
- 107°
- 73°
- $62^\circ, 118^\circ$
- $148^\circ, 32^\circ$
- 51° and 39°

Practice 9-3

- rectangle, square
- parallelogram, rectangle, rhombus, square
- trapezoid, parallelogram, rectangle, rhombus, square
- obtuse scalene
- right scalene
- acute equilateral
- obtuse isosceles
- $12x, 111 \text{ cm}$
- $4x, 7 \text{ yd}$
- $2x + 2y, 32 \text{ m}$

Practice 9-4

- 2
- square, rectangle, isosceles trapezoid
- $3, 0, 0; 4, 1, 2; 5, 2, 5; 6, 3, 9; 8, 5, 20; n, n - 3, \frac{n(n-3)}{2}, \frac{n(n-3)}{2}$
- Aquia
- She is 3 miles west of the post office.

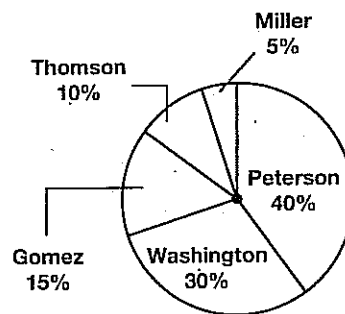
Practice 9-5

- \overline{RS}
- \overline{MH}
- $\angle H$
- $\angle A$
- \overline{MG}
- $\angle G$
- 70°
- 65°
- $\angle B \cong \angle D, \overline{BC} \cong \overline{DC}, \angle ACB \cong \angle ECD, \triangle ABC \cong \triangle ECD, \text{ASA}$
- $\overline{JK} \cong \overline{JM}, \overline{LK} \cong \overline{LM}, \overline{JL} \cong \overline{JL}, \triangle JKL \cong \triangle JML, \text{SSS}$
- \overline{EW}
- $\angle T$
- $\angle WEB$
- \overline{TH}
- \overline{PH}
- $\angle EBL$
- ASA; $x = 24, y = 30, z = 97$

Practice 9-6

- 144°
- 108°
- 54°
- 36°
- 18°

6. Voter Preference for Senator



- 750
- 81.012 m
- 57.148 cm
- 1.7584 km
- 43.96 ft
- 15.7 in.
- 5.495 in.

Practice 9-7

-
-
-
-
-
-
-

8. It seems to be a right angle.

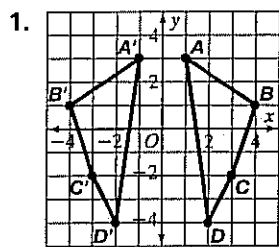
Practice 9-8

- $(x + 4, y - 3)$
- $(x - 2, y - 2)$
- $(x + 3, y + 1)$
- $(x, y + 2)$
-
-

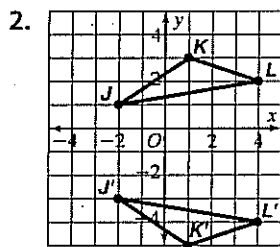
- $(x - 7, y + 3)$
- $(x - 2, y - 8)$

Chapter 9 Answers (continued)

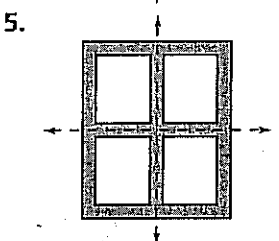
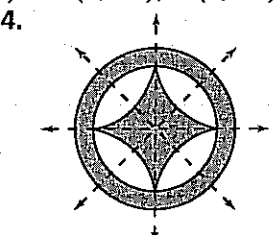
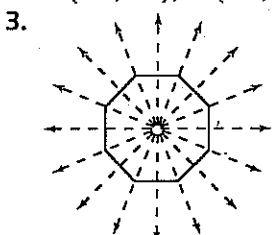
Practice 9-9



$A'(-1, 3), B'(-4, 1),$
 $C'(-3, -2), D'(-2, -4)$



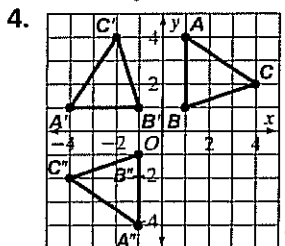
$J'(-2, -3),$
 $K'(1, -5), L'(4, -4)$



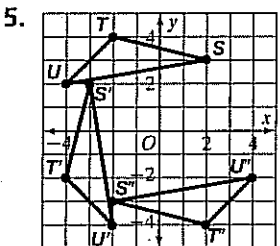
6. no 7. yes
 8. yes

Practice 9-10

1. no 2. yes; 180° 3. yes; 90°



$A'(-4, 1), B'(-1, 1),$
 $C'(-2, 4), A''(-1, -4),$
 $B''(-1, -1), C''(-4, -2)$



$S'(-3, 2), T'(-4, -2),$
 $U'(-2, -4),$
 $S''(-2, -3), T''(2, -4)$
 $U''(4, -2),$

6. $(-y, x)$ 7. $(-x, -y)$

Reteaching 9-1

1. $\overline{G, H}, \overline{J, K}, \overline{L}$ 2. $\overline{GJ}, \overline{GK}, \overline{GL}, \overline{GH}, \overline{LG}, \overline{KG},$
 $\overline{JG}, \overline{HG}$ 3. $\overline{JL}, \overline{LJ}, \overline{JG}, \overline{GJ}, \overline{LG}, \overline{GL}$
 4. $\overline{HG}, \overline{HK}, \overline{GK}$

Reteaching 9-2

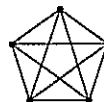
1. $(6x + 60) + 9x = 180$ 2. 8 3. 72° 4. 108°

Reteaching 9-3

1. obtuse isosceles 2. acute scalene 3. right scalene 4. acute equilateral 5. rhombus, parallelogram, quadrilateral 6. square, rhombus, rectangle, parallelogram, quadrilateral

Reteaching 9-4

1. Parth 2. 10



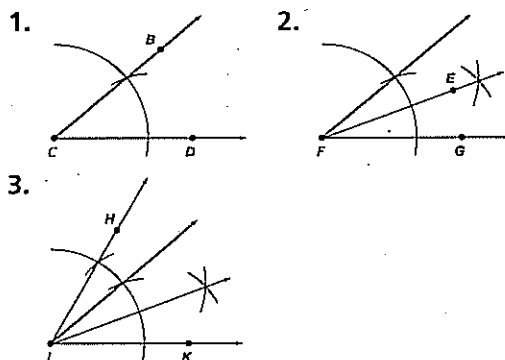
Reteaching 9-5

1. $\angle JLK \cong \angle JLM, \angle LJK \cong \angle LJM, \overline{JL} \cong \overline{JL},$
 $\triangle JLK \cong \triangle JLM, ASA$ 2. $\overline{PQ} \cong \overline{RQ},$
 $\overline{SQ} \cong \overline{TQ}, \angle PQS \cong \angle RQT, \triangle PQS \cong \triangle RQT,$
 SAS 3. $\angle ZWY \cong \angle XWY, \angle ZYW \cong \angle XYW,$
 $\overline{WY} \cong \overline{WY}, \triangle ZWY \cong \triangle XWY, ASA$

Reteaching 9-6

1. 97° 2. 86° 3. 47° 4. 65° 5. 65°

Reteaching 9-7



Reteaching 9-8

1. $(x + 3, y - 1)$ 2. $(x - 4, y + 6)$
 3. $(x - 2, y)$ 4. $(x, y + 4)$ 5. $(x + 1, y + 3)$
 6. $(x - 9, y - 2)$