Name _____ Date _____ Class _____

SECTION 1A

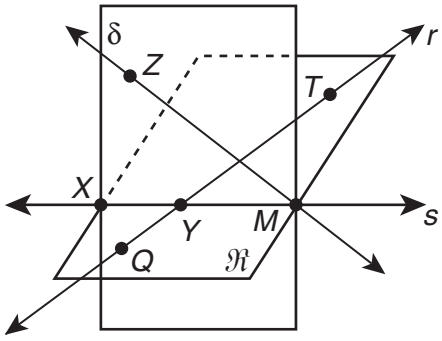
Ready to Go On? Skills Intervention

1-1 Understanding Points, Lines, and Planes

Find these vocabulary words in Lesson 1-1 and the Multilingual Glossary.

Vocabulary				
point	line	plane	collinear	coplanar
segment	endpoint	ray	opposite rays	

Naming Points, Lines, and Planes



A. Name collinear points.

Points that lie on the same line are _____

Name three points on line *r*. _____

Name the points on line *s*. _____

B. Name lines.

To name a line, use either _____,

or two _____.

Name line *s* using two points on the line. _____

Name the line containing point *Z*. _____

Identifying Points and Lines in a Plane

In what plane does *Z* lie? _____

What other points lie in this plane? _____

Drawing Segments and Rays

Draw and label each of the following.

A. A segment with endpoints *H* and *Z*

Draw two dots and label them *H* and *Z*
Use a straightedge to connect the points.

B. ray $\overrightarrow{TR}$

Draw two dots and label them *T* and *R*.
Beginning at *T*, connect the points and extend through *R*.
Draw an arrow to indicate that the ray extends forever.

Name _____ Date _____ Class _____

SECTION 1A

Ready to Go On? Skills Intervention

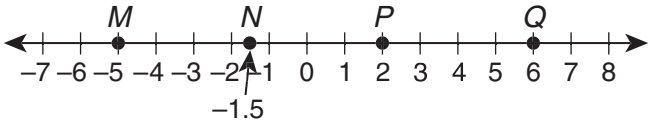
1-2 Measuring and Constructing Segments

Find these vocabulary words in Lesson 1-2 and the Multilingual Glossary.

Vocabulary				
coordinate	distance	length	congruent segments	construction
between	midpoint	bisect		

Finding the length of a segment

Find each length.



A. *MP*

What are the coordinates of *M*?_____ and *P*?_____

$MP = |\_\_\_\_ - \_\_\_\_|$ Substitute the coordinates of *M* and *P*.

$= |\_\_\_\_|$ Subtract.

$= \_\_\_\_$ Take the absolute value of the difference.

B. *NQ*

What are the coordinates of *N*?_____ and *Q*?_____

$NQ = |\_\_\_\_\_ - \_\_\_\_|$ Substitute the coordinates of *N* and *Q*.

$= |\_\_\_\_\_|$ Subtract.

$= \_\_\_\_$ Take the absolute value of the difference.

Using the Segment Addition Postulate

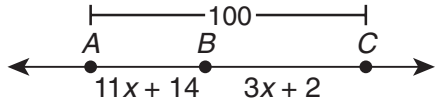
A. *L* is between *K* and *M*. *KL* = 43 and *KM* = 61.5. Find *LM*.

Since *L* is between *K* and *M*, *KL* + ____ = ____.

Substitute the known lengths into the equation: ____ + *LM* = _____

Solve the equation to find *LM*. _____

B. *B* is between *A* and *C*. Find *AB*.



Since *B* is between *A* and *C*, *AB* + ____ = ____.

AB = _____ *BC* = _____ *AC* = ____

Substitute these values into the equation. _____ + _____ = ____

Simplify the right side of the equation. _____ = ____

Get the variable on one side of the equation. ____ = ____

Simplify. ____ = ____

Substitute the value of *x* to find *AB*. *AB* = 11*x* + 14

Simplify. = 11(___) + 14 = ___

Using Midpoints to Find Lengths

Point *M* is the midpoint of *XY*. *XM* = 5*x* + 3, and *MY* = 9*x* − 25. Find *x*, *XM*, *MY*, and *XY*.

Since *M* is the midpoint of *XY*, what do you know about *XM* and *MY*?_____

Write an equation by substituting expressions for *XM* and *MY*._____

Solve the equation to find the value of *x*. _____

XM = 5*x* + 3 = ____; *MY* = 9*x* − 25 = ____; *XY* = ____

Name _____ Date _____ Class _____

SECTION 1A

Ready to Go On? Skills Intervention

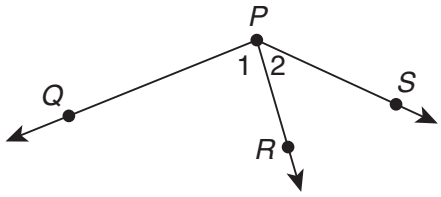
1-3 Measuring and Constructing Angles

Find these vocabulary words in Lesson 1-3 and the Multilingual Glossary.

Vocabulary				
angle	measure	acute angle	right angle	obtuse angle
congruent angles		angle bisector		

Naming Angles

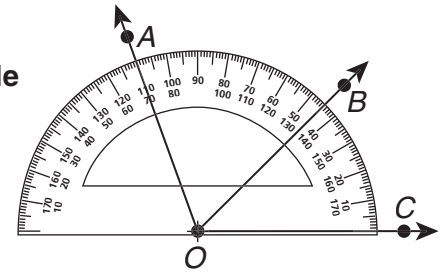
Name angles in the diagram.



You can name an angle in three ways: by its _____,
by a _____ on each ray and the _____,
or by a _____.
How many angles are in the diagram?_____
Point *P* is called the _____ of all of the angles.
Name three angles. _____

Measuring and Classifying Angles

Find the measures of each angle. Then classify each angle as acute, right, or obtuse.



A. $\angle AOC$

The measure of an angle is the _____ of the _____ of the real numbers that the rays correspond with on a protractor.

$m\angle AOC = |\_\_\_\_ - \_\_\_\_| = \_\_\_\_$.

If an angle measures greater than 90° and less than 180°, the angle is _____.

So, $\angle AOC$ is a(n) _____ angle.

B. $\angle AOB$

The real number that $\overrightarrow{OA}$ corresponds with is _____.

The real number that $\overrightarrow{OB}$ corresponds with is _____.

$m\angle AOB = |\_\_\_\_ - \_\_\_\_| = \_\_\_\_$; $\_\_\_\_ - \_\_\_\_ = \_\_\_\_$.

If an angle measures greater than 0° and less than 90°, the angle is _____.

So, $\angle AOB$ is a(n) _____ angle.

Finding the Measure of an Angle

$\overrightarrow{TX}$ bisects $\angle MTR$, $m\angle MTX = (9x - 7)°$, and $m\angle XTR = (6x + 8)°$. Find $m\angle XTR$.

Since $\overrightarrow{TX}$ bisects $\angle MTR$, $m\angle MTX$ = _____.

Substitute the given values and write an equation. _____

Solve for *x*. _____

To find $m\angle XTR$, substitute _____ for *x*.

$m\angle XTR = 6x + 8 = 6(\_\_\_\_) + 8 = \_\_\_\_°$

Name _____ Date _____ Class _____

SECTION 1A

Ready to Go On? Skills Intervention

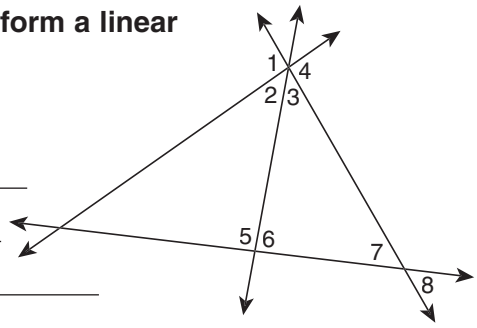
1-4 Pairs of Angles

Find these vocabulary words in Lesson 1-4 and the Multilingual Glossary.

Vocabulary			
adjacent angles	linear pair	complementary angles	supplementary angles

Identifying Angle Pairs

Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.



A. ∠3 and ∠4

Do ∠3 and ∠4 have a common vertex? _____

Do ∠3 and ∠4 have a common side? _____

Do ∠3 and ∠4 have common interior points? _____

∠3 and ∠4 are _____.

B. ∠7 and ∠8

Do ∠7 and ∠8 have a common vertex? _____ Do ∠7 and ∠8 have a common side?_____

Do ∠7 and ∠8 have common interior points? _____ ∠7 and ∠8 are _____.

C. ∠5 and ∠6

Do ∠5 and ∠6 have a common vertex?____ Do ∠5 and ∠6 have a common side? ____

Do ∠5 and ∠6 have common interior points? ____

∠5 and ∠6 are _____.

Finding the Measures of Complements and Supplements

If m∠*R* = (14 + 3*x*)°, find each of the following.

A. complement of ∠*R*

To find the measure of the complement of an angle, _____ the measure of the angle from _____.

Find the measure of the complement of ∠*R* by subtracting (14 + 3*x*)° from _____.

_____ −(14 + 3*x*)° = _____ = (_____)°

B. supplement of ∠*R*

To find the measure of the supplement of an angle, _____ the measure of the angle from _____.

Find the measure of the supplement of ∠*R* by subtracting (14 + 3*x*)° from _____.

_____ −(14 + 3*x*)° = _____ = _____

Name _____ Date _____ Class _____

SECTION 1A

Ready to Go On? Quiz

1-1 Understanding Points, Lines, and Planes

Draw and label each of the following.

1. a line containing points *R* and *S* _____

2. a ray with endpoint *B* that passes through *L* _____

3. a plane containing a segment with endpoints *X* and *Y* _____

4. three coplanar lines intersecting in three points. _____

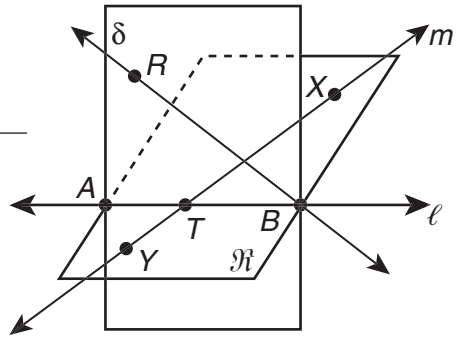
Name each of the following.

5. three collinear points _____

6. a plane containing *X*, *B,* and *Y* _____

7. two segments _____

8. a line containing *A* and *T* _____



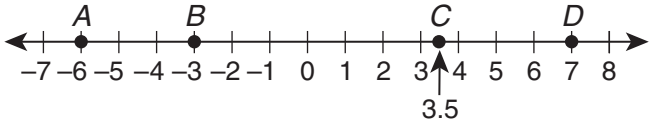
1-2 Measuring and Constructing Segments

Find the length of each segment.

9. $\overline{DB}$ _____

10. $\overline{AB}$ _____

11. $\overline{AC}$ _____



12. Sketch, draw, and construct a segment congruent to $\overline{PQ}$.

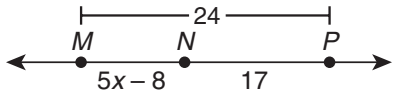
Name _____ Date _____ Class _____

SECTION 1A

Ready to Go On? Quiz continued

13. T is between R and V. $RV = 31$ and $VT = 14$. Find RT. _____

14. N is between M and P. Find MN. _____



***M* is the midpoint of $\overline{AB}$. *AM* = 11*x* − 9, and *BM* = 7*x* + 35.**

15. Find x.

_____

16. Find AM.

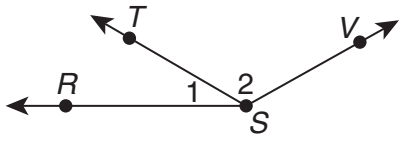
_____

17. Find BM.

_____

1-3 Measuring and Constructing Angles

18. Name all the angles in the diagram.



_____

Classify each angle by its measure.

19. $m\angle XYZ = 90°$

_____

20. $m\angle PQR = 17°$

_____

21. $m\angle BRZ = 178°$

_____

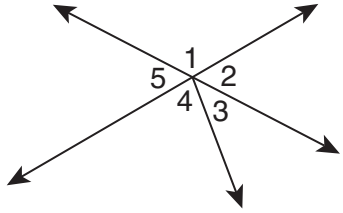
22. $\overrightarrow{MT}$ bisects $\angle LMP$, $m\angle LMT = (4x - 13)°$, and $m\angle TMP = (2x + 17)°$.

Find $m\angle LMP$. _____

23. Use a protractor and a straightedge to draw a 70° angle. Then bisect the angle.

1-4 Pairs of Angles

Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.



24. $\angle 2$ and $\angle 3$ _____

25. $\angle 1$ and $\angle 5$ _____

26. $\angle 3$ and $\angle 1$ _____

If $m\angle P = (9x + 20)°$, find the measure of each of the following.

27. supplement of $\angle P$

_____

28. complement of $\angle P$

_____

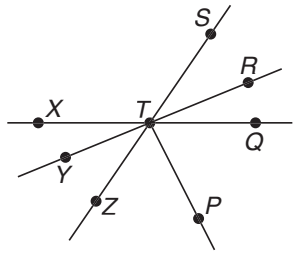
Name _____ Date _____ Class _____

SECTION 1A

Ready to Go On? Enrichment

Measuring Angles and Segments

For Exercises 1–12, use the figure at the right and the information provided to find each angle measure.



$m\angle XTZ = 54°$

$m\angle RTQ = 21°$

$\overrightarrow{TP}$ bisects $\angle QTZ$

1. m$\angle XTS$ _____

2. m$\angle STR$ _____

3. m$\angle QTZ$ _____

4. m$\angle QTP$ _____

5. m$\angle PTZ$ _____

6. m$\angle YTZ$ _____

7. m$\angle XTY$ _____

8. m$\angle RTP$ _____

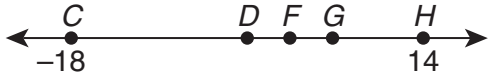
9. m$\angle PTX$ _____

10. m$\angle RTX$ _____

11. m$\angle XTQ$ _____

12. m$\angle STQ$ _____

The figure at right is a number line without tic marks. For Exercises 13–18, use the number line and the information provided. *D* is the midpoint of $\overline{CH}$. *G* is the midpoint of $\overline{DH}$. *F* is the midpoint of $\overline{DG}$.



Find the coordinates.

13. *D* _____

14. *G* _____

15. *F* _____

Find the lengths.

16. *DF* _____

17. *CG* _____

18. *GH* _____

19. *DG* _____

20. *DH* _____

21. *CH* _____

Name _____ Date _____ Class _____

SECTION 1B

Ready To Go On? Skills Intervention

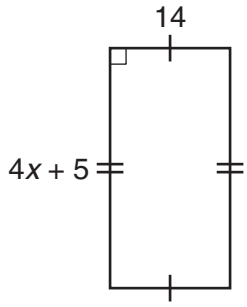
1-5 Using Formulas in Geometry

Find these vocabulary words in Lesson 1-5 and the Multilingual Glossary.

Vocabulary					
perimeter	area	base	height	diameter	radius
circumference		π (pi)			

Finding Perimeter and Area

Find the perimeter and area.



A. What is the formula for perimeter of a rectangle? _____

Substitute the known values into the formula. _____

Simplify. _____

What is the formula for the area of a rectangle? _____

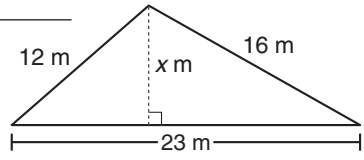
Substitute the known values into the formula. _____

Simplify. _____

B. What is the formula for perimeter of a triangle? _____

Substitute the known values into the formula. _____

Simplify. _____



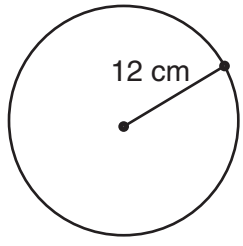
What is the formula for the area of a triangle? _____

Substitute the known values into the formula. _____

Simplify. _____

Finding the Circumference and Area of a Circle

Find the circumference and area of a circle with radius 12 cm. Use the π key on your calculator and round to the nearest tenth.



What is the formula for the circumference of a circle? _____

Substitute the known values into the formula. _____

Simplify. _____

What is the formula for the area of a circle? _____

Substitute the known values into the formula and simplify. _____

Name _____ Date _____ Class _____

SECTION 1B

Ready To Go On? Skills Intervention

1-6 Midpoint and Distance in the Coordinate Plane

Find these vocabulary words in Lesson 1–6 and the Multilingual Glossary.

Vocabulary		
coordinate plane	leg	hypotenuse

Finding the Coordinates of a Midpoint

Find the coordinates of the midpoint of $\overline{KL}$ with endpoints $K(-9, 4)$ and $L(7, -6)$.

Write the Midpoint Formula. _____

Substitute the coordinates of *K* and *L* into the midpoint formula. _____

Simplify to find the coordinates of the midpoint. _____

Finding the Coordinates of an Endpoint

***M* is the midpoint of $\overline{PR}$. *P* has coordinates $(-7, 1)$, and *M* has coordinates $(-1, -4)$. Find the coordinates of *R*.**

The coordinates of *R* are unknown. Let the coordinates of *R* equal (x, y).

Apply the Midpoint Formula. $(-1, -4) = \left(\frac{-7 + x}{\square}, \frac{1 + y}{\square}\right)$

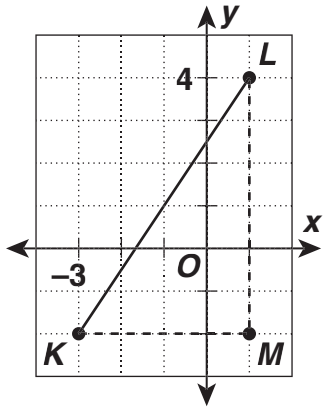
Write and solve an equation to find the *x*-coordinate of *R*. $\frac{-7 + x}{\square} = -1 \longrightarrow x = \square$

Write and solve an equation to find the *y*-coordinate of *R*. $\frac{1 + y}{\square}$ $\square \longrightarrow y = \square$

The coordinates of *R* are (____, ____).

Finding Distances in the Coordinate Plane

Use the Distance Formula and the Pythagorean Theorem to find the distance, to the nearest tenth, from *K* to *L*.



Write the Distance Formula. _____

What are the coordinates of *K*? _____ of *L*? _____

Substitute the coordinates of *K* and *L* into the Distance Formula.

_____

Simplify. The length of $\overline{KL}$ is _____.

Write the Pythagorean Theorem. _____

Substitute the lengths of the legs into the Pythagorean Theorem to find the length of the hypotenuse. _____ Simplify.

The length of the hypotenuse *KL* is _____.

_____ Class _____

SECTION 1B

Ready To Go On? Skills Intervention

1-7 Transformations in the Coordinate Plane

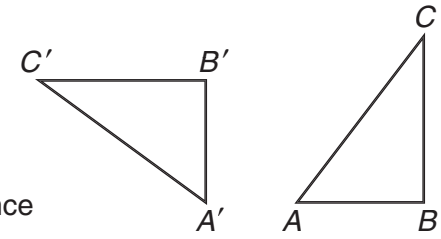
Find these vocabulary words in Lesson 1-7 and the Multilingual Glossary.

Vocabulary					
transformation	preimage	image	reflection	rotation	translation

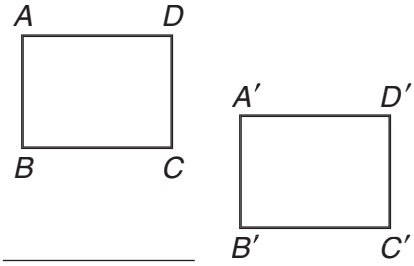
Identifying Transformations

Identify the transformation. Then use arrow notation to describe the transformation.

A. Is each point and its image the same distance from a line of reflection? _____
Is each point and its image the same distance from a point *P*? _____
Have all of the points in the figure moved the same distance in the same direction? _____
Based on the information above, identify the transformation. _____
Use arrow notation to describe the transformation. _____ → _____



B. Is each point and its image the same distance from a line of reflection? _____
Is each point and its image the same distance from a point *P*? _____
Have all of the points in the figure moved the same distance in the same direction? _____
Based on the information above, identify the transformation. _____
Use arrow notation to describe the transformation. _____ → _____

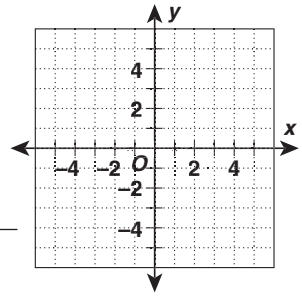


Drawing and Identifying Transformations

A figure has vertices at *X*(−5, 4), *Y*(−2, 0) and *Z*(−5, −4). After a transformation, the image has vertices at *X′*(5, 4), *Y′*(2, 0) and *Z′*(5, −4). Draw the preimage and image. Then identify the transformation.
Plot the points and label each vertex. Connect the vertices.

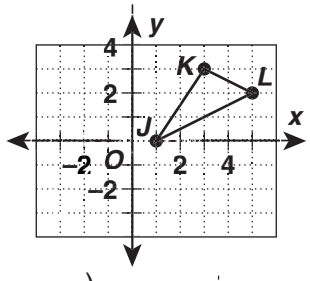
How is each point related to its image? _____

Identify the transformation. _____



Translations in the Coordinate Plane

Find the coordinates for the image of △*JKL* after the translation (*x, y*) → (*x* − 4, *y* − 3). Draw the image.
What are the coordinates of *J*, *K*, and *L*? *J*(__, 0), *K*(3, ___), *L*(___, ___)
To apply (*x*, *y*) → (*x* − 4, *y* − 3), subtract ____ from the *x*-coordinate of each vertex and subtract ____ from the *y*-coordinate of each vertex.
Find the coordinates of *J′*, *K′*, and *L′*. *J′*(−3, ____), *K′*(____, 0), *L′*(____, ____)
Plot the image points. Connect the vertices.



Name _____ Date _____ Class _____

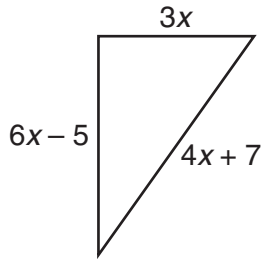
SECTION 1B

Ready to Go On? Quiz

1-5 Using Formulas in Geometry

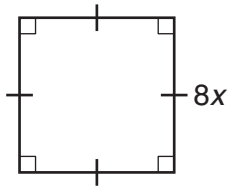
Find the perimeter and area of each figure.

1.



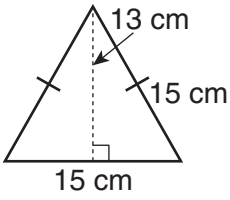
_____

2.



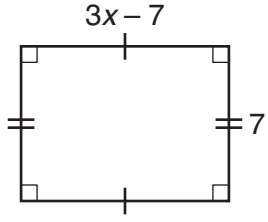
_____

3.



_____

4.



_____

5. Find the circumference and area of a circle with radius 11 in. Use the π key on your calculator and round to the nearest tenth.

_____

1-6 Midpoint and Distance in the Coordinate Plane

6. Find the coordinates of the midpoint of $\overline{HJ}$ with endpoints $H(-7, -4)$, and $J(3, -2)$.

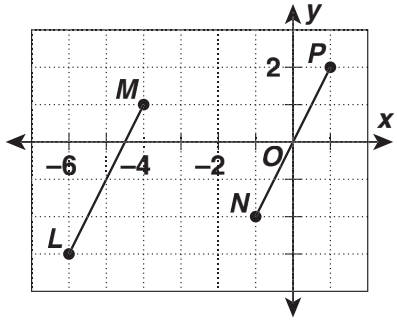
_____

7. S is the midpoint of $\overline{RT}$, R has coordinates $(-5, 1)$ and S has coordinates $(-1, 4)$. Find the coordinates of T.

_____

8. Using the distance formula, find LM and NP to the nearest tenth. Then determine if $\overline{LM} \cong \overline{NP}$.

_____

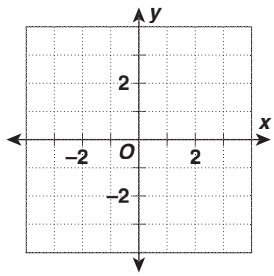


Name _____ Date _____ Class _____

SECTION 1B

Ready to Go On? Quiz continued

9. Using the Distance Formula and the Pythagorean Theorem, find the distance, to the nearest tenth, from $X(3, -2)$ to $Y(-3, 1)$.



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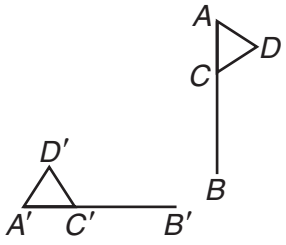
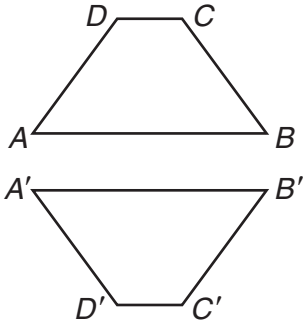
1-7 Transformations in the Coordinate Plane

Identify the transformation. Then use arrow notation to describe the transformation.

10.

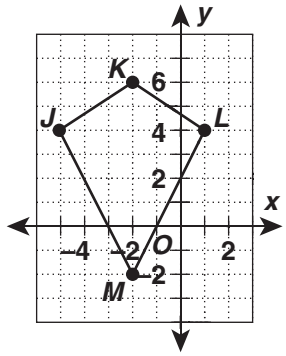


11.



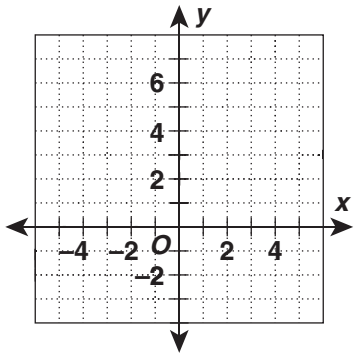
_____ _____

12. Find the coordinates for the image of figure *JKLM* after the translation $(x, y) \longrightarrow (x + 2, y - 2)$. Graph the image.



_____

13. A figure has vertices at $P(-6, -2)$, $Q(-3, 3)$ and $R(-1, -2)$. After a transformation, the image of the figure has vertices at $P'(0, 2)$, $Q'(3, 7)$ and $R'(5, 2)$. Graph the preimage and image. Then, identify the transformation.



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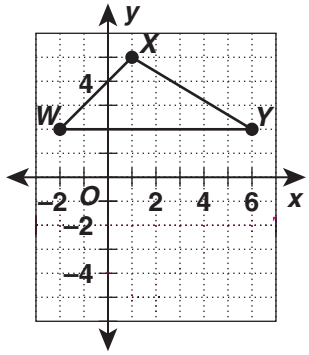
Name _____ Date _____ Class _____

SECTION 1B

Ready to Go On? Enrichment

Reflections

Use the figure at the right to answer each question.



1. Reflect $\triangle WXY$ over the x-axis. Label the vertices of the image W', X', and Y' respectively.

2. Find the coordinates of W', X', and Y'.

_____

3. How are the coordinates of the preimage related to the coordinates of the image?

_____

Use the Distance Formula to find each of the following to the nearest tenth.

4. WX _____

5. XY _____

6. WY _____

7. $W'X'$ _____

8. $X'Y'$ _____

9. $W'Y'$ _____

10. How are the lengths of the segments of the preimage related to the lengths of the segments in the image?

_____

11. Find the perimeters of each triangle.

_____

12. How are the perimeters related? _____

13. What are the lengths of the base and height of $\triangle WXY$? _____

14. What is the area of $\triangle WXY$? _____

15. What are the lengths of the base and height of $\triangle W'X'Y'$? _____

16. What is the area of $\triangle W'X'Y'$? _____

17. How are the areas related? _____

18. What do you think is true about the perimeter and area of the image of $\triangle WXY$ after a translation? Why?

_____

_____

SECTION 1A

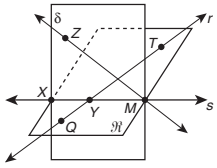
Ready to Go On? Skills Intervention

1-1 Understanding Points, Lines, and Planes

Find these vocabulary words in Lesson 1-1 and the Multilingual Glossary.

Vocabulary				
point	line	plane	collinear	coplanar
segment	endpoint	ray	opposite rays	

Naming Points, Lines, and Planes



A. Name collinear points.

Points that lie on the same line are collinear.

Name three points on line *r*. T, Y, Q

Name the points on line *s*. X, Y, M

B. Name lines.

To name a line, use either a lowercase letter,

or two points on the line.

Name line *s* using two points on the line. $\overleftrightarrow{XM}$ or $\overleftrightarrow{MX}$ or $\overleftrightarrow{XY}$ or $\overleftrightarrow{YX}$ or $\overleftrightarrow{YM}$ or $\overleftrightarrow{MY}$

Name the line containing point *Z*. $\overleftrightarrow{ZM}$ or $\overleftrightarrow{MZ}$

Identifying Points and Lines in a Plane

Name three points that lie in the same plane as point *Z*.

In what plane does *Z* lie? δ

What other points lie in this plane? X, Y, M, Q

Drawing Segments and Rays

Draw and label each of the following.

A. A segment with endpoints *H* and *Z*

Draw two dots and label them *H* and *Z*
Use a straightedge to connect the points.

B. ray $\overrightarrow{TR}$

Draw two dots and label them *T* and *R*.
Beginning at *T*, connect the points and extend through *R*.
Draw an arrow to indicate that the ray extends forever.

SECTION 1A

Ready to Go On? Skills Intervention

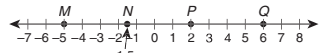
1-2 Measuring and Constructing Segments

Find these vocabulary words in Lesson 1-2 and the Multilingual Glossary.

Vocabulary				
coordinate	distance	length	congruent segments	construction
between	midpoint	bisect		

Finding the length of a segment

Find each length.



A. *MP*

What are the coordinates of *M*? −5 and *P*? 2

MP = |−5 − 2| Substitute the coordinates of *M* and *P*.
= |−7| Subtract.
= 7 Take the absolute value of the difference.

B. *NQ*

What are the coordinates of *N*? −1.5 and *Q*? 6

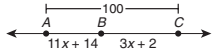
NQ = |−1.5 − 6| Substitute the coordinates of *N* and *Q*.
= |−7.5| Subtract.
= 7.5 Take the absolute value of the difference.

Using the Segment Addition Postulate

A. *L* is between *K* and *M*. *KL* = 43 and *KM* = 61.5. Find *LM*.

Since *L* is between *K* and *M*, *KL* + LM = KM.
Substitute the known lengths into the equation: 43 + *LM* = 61.5
Solve the equation to find *LM*. 18.5

B. *B* is between *A* and *C*. Find *AB*.



Since *B* is between *A* and *C*, *AB* + BC = AC.
AB = 11x + 14 *BC* = 3x + 2 *AC* = 100
Substitute these values into the equation. 11x + 14 + 3x + 2 = 100
Simplify the right side of the equation. 14x + 16 = 100
Get the variable on one side of the equation. 14x = 84
Simplify. x = 6
Substitute the value of *x* to find *AB*. *AB* = 11x + 14
Simplify. = 11(6) + 14 = 80

Using Midpoints to Find Lengths

Point *M* is the midpoint of *XY*. *XM* = 5*x* + 3, and *MY* = 9*x* − 25.
Find *x*, *XM*, *MY*, and *XY*.

Since *M* is the midpoint of *XY*, what do you know about *XM* and *MY*? They are equal.
Write an equation by substituting expressions for *XM* and *MY*. 5x + 3 = 9x − 25
Solve the equation to find the value of *x*. x = 7
XM = 5*x* + 3 = 38; *MY* = 9*x* − 25 = 38; *XY* = 76

SECTION 1A

Ready to Go On? Skills Intervention

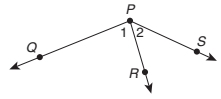
1-3 Measuring and Constructing Angles

Find these vocabulary words in Lesson 1-3 and the Multilingual Glossary.

Vocabulary				
angle	measure	acute angle	right angle	obtuse angle
congruent angles		angle bisector		

Naming Angles

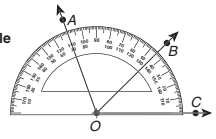
Name angles in the diagram.



You can name an angle in three ways: by its vertex, by a point on each ray and the vertex, or by a number.
How many angles are in the diagram? 3
Point *P* is called the vertex of all of the angles.
Name three angles. ∠1, ∠2, ∠*QPR*, ∠*QPS*, ∠*RPS*

Measuring and Classifying Angles

Find the measures of each angle. Then classify each angle as acute, right, or obtuse.



A. ∠*AOC*

The measure of an angle is the difference of the absolute value of the real numbers that the rays correspond with on a protractor.
m∠*AOC* = |110 − 0| = 110°.
If an angle measures greater than 90° and less than 180°, the angle is obtuse.
So, ∠*AOC* is a(n) obtuse angle.

B. ∠*AOB*

The real number that $\overrightarrow{OA}$ corresponds with is 70.
The real number that $\overrightarrow{OB}$ corresponds with is 135.
m∠*AOB* = |70 − 135| = 65°.
If an angle measures greater than 0° and less than 90°, the angle is acute.
So, ∠*AOB* is a(n) acute angle.

Finding the Measure of an Angle

$\overrightarrow{TX}$ bisects ∠*MTR*, m∠*MTX* = (9*x* − 7)°, and m∠*XTR* = (6*x* + 8)°. Find m∠*XTR*.

Since $\overrightarrow{TX}$ bisects ∠*MTR*, m∠*MTX* = m∠*XTR*.
Substitute the given values and write an equation. 9x − 7 = 6x + 8
Solve for *x*. x = 5
To find m∠*XTR*, substitute 5 for *x*.
m∠*XTR* = 6*x* + 8 = 6(5) + 8 = 38°

SECTION 1A

Ready to Go On? Skills Intervention

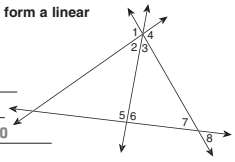
1-4 Pairs of Angles

Find these vocabulary words in Lesson 1-4 and the Multilingual Glossary.

Vocabulary			
adjacent angles	linear pair	complementary angles	supplementary angles

Identifying Angle Pairs

Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.



A. ∠3 and ∠4

Do ∠3 and ∠4 have a common vertex? Yes
Do ∠3 and ∠4 have a common side? Yes
Do ∠3 and ∠4 have common interior points? No
∠3 and ∠4 are only adjacent.

B. ∠7 and ∠8

Do ∠7 and ∠8 have a common vertex? Yes Do ∠7 and ∠8 have a common side? No
Do ∠7 and ∠8 have common interior points? No ∠7 and ∠8 are not adjacent.

C. ∠5 and ∠6

Do ∠5 and ∠6 have a common vertex? Yes Do ∠5 and ∠6 have a common side? Yes
Do ∠5 and ∠6 have common interior points? No
∠5 and ∠6 are adjacent and form a linear pair.

Finding the Measures of Complements and Supplements

If m∠*R* = (14 + 3*x*)°, find each of the following.

A. complement of ∠*R*

To find the measure of the complement of an angle, subtract the measure of the angle from 90°.
Find the measure of the complement of ∠*R* by subtracting (14 + 3*x*)° from 90°.
90° −(14 + 3*x*)° = 90° − 14° − 3*x*° = (76 − 3*x*)°

B. supplement of ∠*R*

To find the measure of the supplement of an angle, subtract the measure of the angle from 180°.
Find the measure of the supplement of ∠*R* by subtracting (14 + 3*x*)° from 180°.
180° −(14 + 3*x*)° = 180° − 14° − 3*x*° = (166 − 3*x*)°

SECTION 1A Ready to Go On? Quiz

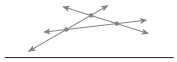
1-1 Understanding Points, Lines, and Planes
Draw and label each of the following.

1. a line containing points *R* and *S*

2. a ray with endpoint *B* that passes through *L*

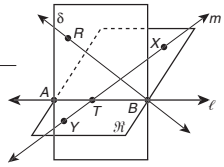
3. a plane containing a segment with endpoints *X* and *Y*

4. three coplanar lines intersecting in three points.

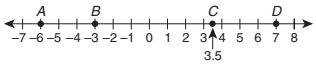


Name each of the following. Sample answers:

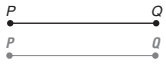
5. three collinear points *Y, T, X* or *A, T, B*
6. a plane containing *X, B,* and *Y* $\mathcal{R}$
7. two segments $\overline{TX}$, $\overline{YT}$, $\overline{YX}$, $\overline{AT}$, $\overline{BT}$, $\overline{AB}$, $\overline{RB}$
8. a line containing *A* and *T* ℓ or $\overleftrightarrow{AB}$, $\overleftrightarrow{AT}$, $\overleftrightarrow{TB}$



1-2 Measuring and Constructing Segments
Find the length of each segment.



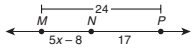
9. $\overline{DB}$ 10
10. $\overline{AB}$ 3
11. $\overline{AC}$ 9.5
12. Sketch, draw, and construct a segment congruent to $\overline{PQ}$.



P Q

SECTION 1A Ready to Go On? Quiz continued

13. *T* is between *R* and *V*. *RV* = 31 and *VT* = 14. Find *RT*. 17
14. *N* is between *M* and *P*. Find *MN*. 7

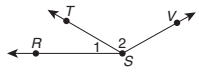


***M* is the midpoint of $\overline{AB}$. *AM* = 11*x* − 9, and *BM* = 7*x* + 35.**

15. Find *x*. 11
16. Find *AM*. 112
17. Find *BM*. 112

1-3 Measuring and Constructing Angles

18. Name all the angles in the diagram. ∠1, ∠2, ∠*RST*, ∠*TSV*, ∠*RSV*



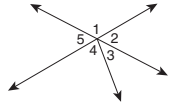
Classify each angle by its measure.

19. m∠*XYZ* = 90° Right
20. m∠*PQR* = 17° Acute
21. m∠*BRZ* = 178° Obtuse

22. $\overrightarrow{MT}$ bisects ∠*LMP*, m∠*LMT* = (4*x* − 13)°, and m∠*TMP* = (2*x* + 17)°. Find m∠*LMP*. 47°
23. Use a protractor and a straightedge to draw a 70° angle. Then bisect the angle.

1-4 Pairs of Angles
Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.

24. ∠2 and ∠3 Only adjacent
25. ∠1 and ∠5 Adjacent and form a linear pair
26. ∠3 and ∠1 Not adjacent



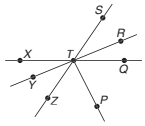
If m∠*P* = (9*x* + 20)°, find the measure of each of the following.

27. supplement of ∠*P* (160 − 9*x*)°
28. complement of ∠*P* (70 − 9*x*)°

SECTION 1A Ready to Go On? Enrichment

Measuring Angles and Segments
For Exercises 1–12, use the figure at the right and the information provided to find each angle measure.

m∠*XTZ* = 54°
m∠*RTQ* = 21°
$\overrightarrow{TP}$ bisects ∠*QTZ*



1. m∠*XTS* 126°
2. m∠*STR* 33°
3. m∠*QTZ* 126°
4. m∠*QTP* 63°
5. m∠*PTZ* 63°
6. m∠*YTZ* 33°
7. m∠*XTY* 21°
8. m∠*RTP* 84°
9. m∠*PTX* 117°
10. m∠*RTX* 159°
11. m∠*XTQ* 180°
12. m∠*STQ* 54°

The figure at right is a number line without tic marks. For Exercises 13–18, use the number line and the information provided. *D* is the midpoint of $\overline{CH}$. *G* is the midpoint of $\overline{DH}$. *F* is the midpoint of $\overline{DG}$.

Find the coordinates.

13. *D* −2
14. *G* 6
15. *F* 2

Find the lengths.

16. *DF* 4
17. *CG* 24
18. *GH* 8
19. *DG* 8
20. *DH* 16
21. *CH* 32

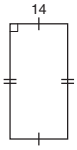
SECTION 1B Ready To Go On? Skills Intervention

1-5 Using Formulas in Geometry

Find these vocabulary words in Lesson 1-5 and the Multilingual Glossary.

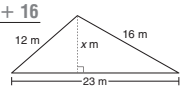
Vocabulary					
perimeter	area	base	height	diameter	radius
circumference		π (pi)			

Finding Perimeter and Area
Find the perimeter and area.

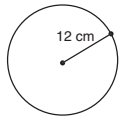


A. What is the formula for perimeter of a rectangle? $P = 2\ell + 2w$
Substitute the known values into the formula. $P = 2(14) + 2(4x + 5)$
Simplify. $P = 8x + 38$
What is the formula for the area of a rectangle? $A = \ell w$
Substitute the known values into the formula. $A = 14(4x + 5)$
Simplify. $A = 56x + 70$

B. What is the formula for perimeter of a triangle? $P = a + b + c$
Substitute the known values into the formula. $P = 23 + 12 + 16$
Simplify. $P = 51$ m
What is the formula for the area of a triangle? $A = \frac{1}{2}bh$
Substitute the known values into the formula. $A = \frac{1}{2}(23)(x)$
Simplify. $A = 11.5x\ \text{m}^2$



Finding the Circumference and Area of a Circle
Find the circumference and area of a circle with radius 12 cm. Use the π key on your calculator and round to the nearest tenth.



What is the formula for the circumference of a circle? $C = 2\pi r$
Substitute the known values into the formula. $C = 2\pi(12)$
Simplify. $C \approx 75.4$ cm
What is the formula for the area of a circle? $A = \pi r^2$
Substitute the known values into the formula and simplify. $A = \pi(12)^2 \approx 452.4\ \text{cm}^2$

SECTION 1B

Ready To Go On? Skills Intervention

1-6 Midpoint and Distance in the Coordinate Plane

Find these vocabulary words in Lesson 1–6 and the Multilingual Glossary.

Vocabulary		
coordinate plane	leg	hypotenuse

Finding the Coordinates of a Midpoint

Find the coordinates of the midpoint of $\overline{KL}$ with endpoints $K(-9, 4)$ and $L(7, -6)$.

Write the Midpoint Formula. $\left(\frac{x_1 + x_2}{2}\right), \left(\frac{y_1 + y_2}{2}\right)$

Substitute the coordinates of K and L into the midpoint formula. $\left(\frac{-9 + 7}{2}, \frac{4 + -6}{2}\right)$

Simplify to find the coordinates of the midpoint. $(-1, -1)$

Finding the Coordinates of an Endpoint

M is the midpoint of $\overline{PR}$. P has coordinates $(-7, 1)$, and M has coordinates $(-1, -4)$. Find the coordinates of R.

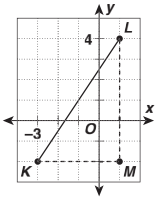
The coordinates of R are unknown. Let the coordinates of R equal (x, y).

Apply the Midpoint Formula. $(-1, -4) = \left(\frac{-7 + x}{2}, \frac{1 + y}{2}\right)$

Write and solve an equation to find the x-coordinate of R. $\frac{-7 + x}{2} = -1 \rightarrow x = 5$

Write and solve an equation to find the y-coordinate of R. $\frac{1 + y}{2} = -4 \rightarrow y = -9$

The coordinates of R are $(5, -9)$.



Finding Distances in the Coordinate Plane

Use the Distance Formula and the Pythagorean Theorem to find the distance, to the nearest tenth, from K to L.

Write the Distance Formula. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

What are the coordinates of K? $(-3, -2)$ of L? $(1, 4)$

Substitute the coordinates of K and L into the Distance Formula.

$d = \sqrt{(1 - {}^-3)^2 + (4 - {}^-2)^2}$

Simplify. The length of $\overline{KL}$ is ≈ 7.2.

Write the Pythagorean Theorem. $a^2 + b^2 = c^2$

Substitute the lengths of the legs into the Pythagorean Theorem to find the length of the hypotenuse. $4^2 + 6^2 = c^2$ Simplify.

The length of the hypotenuse KL is ≈ 7.2.

SECTION 1B

Ready To Go On? Skills Intervention

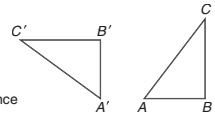
1-7 Transformations in the Coordinate Plane

Find these vocabulary words in Lesson 1-7 and the Multilingual Glossary.

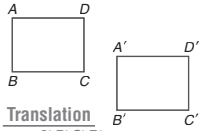
Vocabulary					
transformation	preimage	image	reflection	rotation	translation

Identifying Transformations

Identify the transformation. Then use arrow notation to describe the transformation.



A. Is each point and its image the same distance from a line of reflection? No
Is each point and its image the same distance from a point P? Yes
Have all of the points in the figure moved the same distance in the same direction? No
Based on the information above, identify the transformation. Rotation
Use arrow notation to describe the transformation. $\triangle ABC \rightarrow \triangle A'B'C'$



B. Is each point and its image the same distance from a line of reflection? No
Is each point and its image the same distance from a point P? No
Have all of the points in the figure moved the same distance in the same direction? Yes
Based on the information above, identify the transformation. Translation
Use arrow notation to describe the transformation. $ABCD \rightarrow A'B'C'D'$

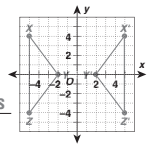
Drawing and Identifying Transformations

A figure has vertices at $X(-5, 4)$, $Y(-2, 0)$ and $Z(-5, -4)$. After a transformation, the image has vertices at $X'(5, 4)$, $Y'(2, 0)$ and $Z'(5, -4)$. Draw the preimage and image. Then identify the transformation.

Plot the points and label each vertex. Connect the vertices.

How is each point related to its image? Same distance from y-axis

Identify the transformation. Reflection across y-axis



Translations in the Coordinate Plane

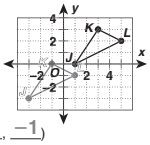
Find the coordinates for the image of $\triangle JKL$ after the translation $(x, y) \rightarrow (x - 4, y - 3)$. Draw the image.

What are the coordinates of J, K, and L? $J(1, 0)$, $K(3, 3)$, $L(5, 2)$

To apply $(x, y) \rightarrow (x - 4, y - 3)$, subtract 4 from the x-coordinate of each vertex and subtract 3 from the y-coordinate of each vertex.

Find the coordinates of J', K', and L'. $J'(-3, -3)$, $K'(-1, 0)$, $L'(1, -1)$

Plot the image points. Connect the vertices.



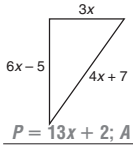
SECTION 1B

Ready to Go On? Quiz

1-5 Using Formulas in Geometry

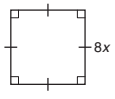
Find the perimeter and area of each figure.

1.



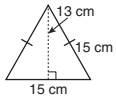
$P = 13x + 2$; $A = 9x^2 - 7.5x$

2.



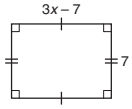
$P = 32x$; $A = 64x^2$

3.



$P = 45$ cm; $A = 97.5$ cm^2

4.



$P = 6x$; $A = 21x - 49$

5. Find the circumference and area of a circle with radius 11 in. Use the π key on your calculator and round to the nearest tenth.

$C \approx 69.1$ in.; $A \approx 380.1$ in.^{2}

1-6 Midpoint and Distance in the Coordinate Plane

6. Find the coordinates of the midpoint of $\overline{HJ}$ with endpoints $H(-7, -4)$, and $J(3, -2)$.

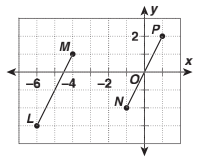
$(-2, -3)$

7. S is the midpoint of $\overline{RT}$, R has coordinates $(-5, 1)$ and S has coordinates $(-1, 4)$. Find the coordinates of T.

$(3, 7)$

8. Using the distance formula, find LM and NP to the nearest tenth. Then determine if $\overline{LM} \cong \overline{NP}$.

4.5; 4.5; Yes, the segments are congruent.

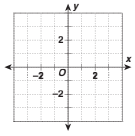


SECTION 1B

Ready to Go On? Quiz continued

9. Using the Distance Formula and the Pythagorean Theorem, find the distance, to the nearest tenth, from $X(3, -2)$ to $Y(-3, 1)$.

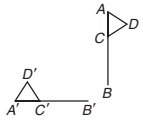
6.7



1-7 Transformations in the Coordinate Plane

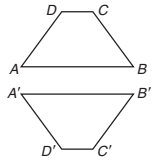
Identify the transformation. Then use arrow notation to describe the transformation.

10.



90° rotation; $ADCB \rightarrow A'D'C'B'$

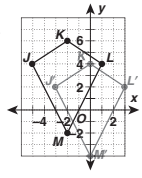
11.



Reflection $ABCD \rightarrow A'B'C'D'$

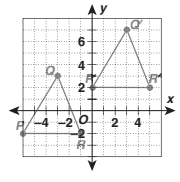
12. Find the coordinates for the image of figure $JKLM$ after the translation $(x, y) \rightarrow (x + 2, y - 2)$. Graph the image.

$J'(-3, 2)$, $K'(0, 4)$, $L'(3, 2)$, $M'(0, -4)$



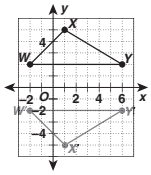
13. A figure has vertices at $P(-6, -2)$, $Q(-3, 3)$ and $R(-1, -2)$. After a transformation, the image of the figure has vertices at $P'(0, 2)$, $Q'(3, 7)$ and $R'(5, 2)$. Graph the preimage and image. Then, identify the transformation.

Translation $(x, y) \rightarrow (x + 6, y + 4)$



SECTION 1B Ready to Go On? Enrichment

Reflections
Use the figure at the right to answer each question.



1. Reflect $\triangle WXY$ over the x-axis. Label the vertices of the image W', X', and Y' respectively.
2. Find the coordinates of W', X', and Y'.
   $W'(-2, -2)$, $X'(1, -5)$, $Y'(6, -2)$
3. How are the coordinates of the preimage related to the coordinates of the image?
   The x-coordinates are the same, but the y-coordinates are opposites.

Use the Distance Formula to find each of the following to the nearest tenth.

4. WX: 4.2
5. XY: 5.8
6. WY: 8.0
7. $W'X'$: 4.2
8. $X'Y'$: 5.8
9. $W'Y'$: 8.0
10. How are the lengths of the segments of the preimage related to the lengths of the segments in the image?
    They are equal.
11. Find the perimeters of each triangle.
    Perimeters of both triangles equal 18 units.
12. How are the perimeters related? They are equal.
13. What are the lengths of the base and height of $\triangle WXY$? $b = 8, h = 3$
14. What is the area of $\triangle WXY$? 12 units^2
15. What are the lengths of the base and height of $\triangle W'X'Y'$? $b = 8, h = 3$
16. What is the area of $\triangle W'X'Y'$? 12 units^2
17. How are the areas related? They are equal.
18. What do you think is true about the perimeter and area of the image of $\triangle WXY$ after a translation? Why?
    The perimeter and area of the preimage will be equal to the perimeter and area of the image because the shape and size of the triangle does not change.

SECTION 2A Ready to Go On? Skills Intervention
2-1 Using Inductive Reasoning to Make Conjectures

Find these vocabulary words in Lesson 2-1 and the Multilingual Glossary.

Vocabulary		
inductive reasoning	conjecture	counterexample

Identifying a Pattern
Find the next term in each pattern.

A. 3, 6, 12, 24, …

Describe the pattern in the list. The pattern is generated by doubling each term.

What number comes next in the pattern? 48

B. 

Describe the pattern of the figures. Segments are drawn from one vertex to other vertices.

Sketch the figure that will come next in the pattern.

Making a Conjecture
Complete the conjecture. The sum of two odd numbers is ?.

What is a conjecture? A statement believed to be true based on inductive reasoning.

List some examples and look for a pattern.

$1 + 3 =$ 4
$3 + 5 =$ 8
$5 + 7 =$ 12
7 + 9 = 16

What kind of number is each sum, odd or even? Even

The sum of two odd numbers is even.

Finding a Counterexample
Show that the conjecture is false by finding a counterexample.
If $AB + BC = AC$, then B is the midpoint of AC.

What is a counterexample? One example that makes a conjecture not true.

What must be true for a point to be a midpoint? The endpoints and the midpoint must be collinear and the midpoint must bisect the segment.

Sketch a figure that is a counterexample to the conjecture. Sample sketch: 

SECTION 2A Ready to Go On? Problem Solving Intervention
2-1 Using Inductive Reasoning to Make Conjectures

When you are given a table of data, look for a pattern to see if you can make a conjecture about the data.

To treat a dog for epilepsy, a veterinarian gives the dog a dose of medication and monitors the level of medication in the dog's bloodstream every three hours. The monitoring results are given in the table. Make a conjecture about the rate at which the amount of medication in the dog's bloodstream is changing.

Number of hours	0	3	6	9
Amount of medication in bloodstream (mg)	62	31	15.5	7.75

Understand the Problem

1. What data is being recorded by the veterinarian?
   The amount of medication in the dog's bloodstream.
2. How many milligrams of medication was the dog given initially? 62 mg
3. How often is the veterinarian monitoring the dog's bloodstream? Every 3 hours

Make a Plan

4. Is the amount of medication in the dog's bloodstream increasing or decreasing? Decreasing
5. Describe the pattern you see in the data.
   $62 - 31 =$ 31; $31 - 15.5 =$ 15.5; $15.5 - 7.75 =$ 7.75
   The medication is decreasing at a rate of 50% every 3 hours.

Solve

6. Complete the conjecture based on the patterns you observed in the data.
   The amount of medication in the dog's blood is decreasing at a rate of 50% or $\frac{1}{2}$ every 3 hours.

Lood Back

7. Prove your conjecture or find a counterexample to show that your conjecture is false.
   $62 \times \frac{1}{2} =$ 31; $31 \times \frac{1}{2} =$ 15.5; $15.5 \times \frac{1}{2} =$ 7.75
   The conjecture is true.

SECTION 2A Ready to Go On? Skills Intervention
2-2 Conditional Statements

Find these vocabulary words in Lesson 2-2 and the Multilingual Glossary.

Vocabulary					
conditional statement	hypothesis	conclusion	truth value	negation	inverse
converse	contrapositive		logically equivalent statements		

Writing a Conditional Statement
Write a conditional statement: "Two lines intersect in exactly one point."

Identify the hypothesis. Two lines intersect

Identify the conclusion. They intersect in exactly one point.

Write the conditional. If two lines intersect, then they intersect in exactly one point.

Analyzing the Truth Value of a Conditional Statement

A. Determine if the conditional statement "If $a > b$, then $\frac{1}{a} > \frac{1}{b}$ is true." If false, give a counterexample.

Choose values for a and b where $a > b$; for example $a = 3$ and $b = 2$.

Substitute these values into the conclusion $\frac{1}{a} > \frac{1}{b}$. $\frac{1}{3} > \frac{1}{2}$

Is the conclusion true? No Is the conditional statement true? No

B. Write the converse and inverse of the conditional statement, "If a number is divisible by 3, then it is divisible by 9." Find the truth value of each.

Identify the hypothesis. A number is divisible by 3.

Identify the conclusion. A number is divisible by 9.

What is the truth value of the statement? False

The converse of a conditional is formed by exchanging the hypothesis and conclusion.

Write the converse: If a number is divisible by 9, then it is divisible by 3.

Truth value? True

The inverse of a conditional is formed by negating the hypothesis and conclusion.

Write the inverse: If a number is not divisible by 3, then it is not divisible by 9. Truth value? True