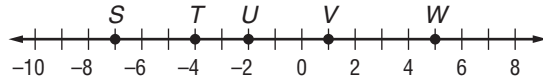


# 1-3 Practice

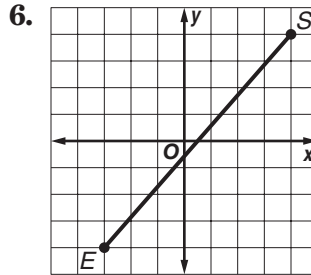
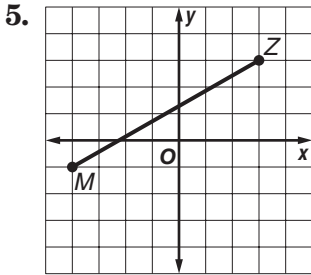
## Distance and Midpoints

Use the number line to find each measure.

1.  $VW$
2.  $TV$
3.  $ST$
4.  $SV$



Use the Pythagorean Theorem to find the distance between each pair of points.

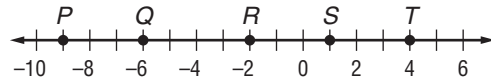


Use the Distance Formula to find the distance between each pair of points.

7.  $L(-7, 0), Y(5, 9)$
8.  $U(1, 3), B(4, 6)$

Use the number line to find the coordinate of the midpoint of each segment.

9.  $\overline{RT}$
10.  $\overline{QR}$
11.  $\overline{ST}$
12.  $\overline{PR}$



Find the coordinates of the midpoint of a segment having the given endpoints.

13.  $K(-9, 3), H(5, 7)$
14.  $W(-12, -7), T(-8, -4)$

Find the coordinates of the missing endpoint given that  $E$  is the midpoint of  $\overline{DF}$ .

15.  $F(5, 8), E(4, 3)$
16.  $F(2, 9), E(-1, 6)$
17.  $D(-3, -8), E(1, -2)$

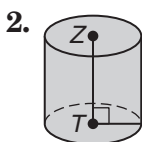
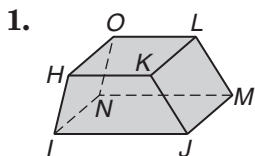
18. **PERIMETER** The coordinates of the vertices of a quadrilateral are  $R(-1, 3), S(3, 3), T(5, -1),$  and  $U(-2, -1)$ . Find the perimeter of the quadrilateral. Round to the nearest tenth.

**1-7**

**Practice**

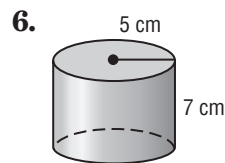
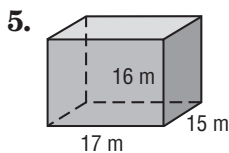
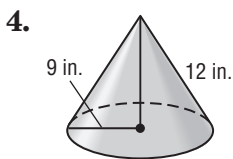
**Three-Dimensional Figures**

Identify each solid. Name the bases, faces, edges, and vertices.



3. **MINERALS** Pyrite, also known as fool's gold, can form crystals that are perfect cubes. Suppose a gemologist wants to cut a cube of pyrite to get a square and a rectangular face. What cuts should be made to get each of the shapes? Illustrate your answers.

Find the surface area and volume of each solid.



7. **COOKING** A cylindrical can of soup has a height of 4 inches and a radius of 2 inches. What is the volume of the can? Round to the nearest tenth.

8. **BUSINESS** A company needs boxes to hold stacks 8.5 inch by 11 inch papers. If they would like the volume of the box to be 500 cubic inches, then what should the height of the box be? Round to the nearest tenth.

# 3-3

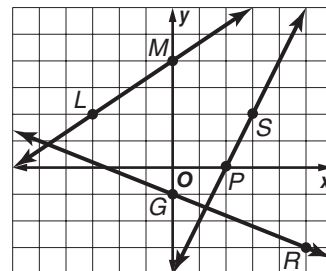
## Practice Slopes of Lines

Determine the slope of the line that contains the given points.

1.  $B(-4, 4), R(0, 2)$                       2.  $I(-2, -9), P(2, 4)$

Find the slope of each line.

3.  $\overline{LM}$                                       4.  $\overline{GR}$
5. a line parallel to  $\overline{GR}$                       6. a line perpendicular to  $\overline{PS}$

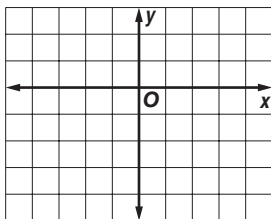


Determine whether  $\overline{KM}$  and  $\overline{ST}$  are *parallel, perpendicular, or neither*.

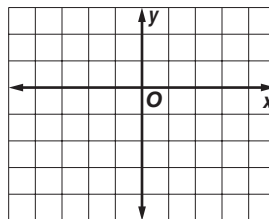
7.  $K(-1, -8), M(1, 6), S(-2, -6), T(2, 10)$                       8.  $K(-5, -2), M(5, 4), S(-3, 6), T(3, -4)$
9.  $K(-4, 10), M(2, -8), S(1, 2), T(4, -7)$                       10.  $K(-3, -7), M(3, -3), S(0, 4), T(6, -5)$

Graph the line that satisfies each condition.

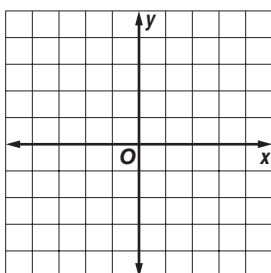
11. slope =  $-\frac{1}{2}$ , contains  $U(2, -2)$



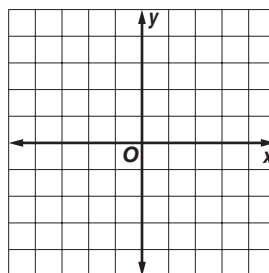
12. slope =  $\frac{4}{3}$ , contains  $P(-3, -3)$



13. contains  $B(-4, 2)$ , parallel to  $\overline{FG}$  with  $F(0, -3)$  and  $G(4, -2)$



14. contains  $Z(-3, 0)$ , perpendicular to  $\overline{EK}$  with  $E(-2, 4)$  and  $K(2, -2)$



15. **PROFITS** After Take Two began renting DVDs at their video store, business soared. Between 2000 and 2005, profits increased at an average rate of \$9,000 per year. Total profits in 2005 were \$45,000. If profits continue to increase at the same rate, what will the total profit be in 2009?

**3-4 Practice****Equations of Lines**

Write an equation in slope-intercept form of the line having the given slope and  $y$ -intercept.

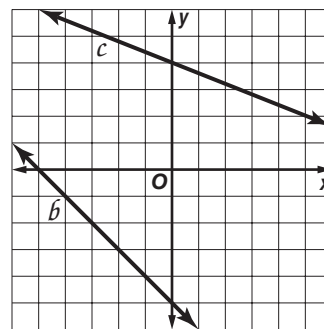
1.  $m: \frac{2}{3}$ ,  $y$ -intercept:  $-10$       2.  $m: -\frac{7}{9}$ ,  $(0, -\frac{1}{2})$       3.  $m: 4.5$ ,  $(0, 0.25)$

Write equations in point-slope form and slope-intercept form of the line having the given slope and containing the given point.

4.  $m: \frac{3}{2}$ ,  $(4, 6)$       5.  $m: -\frac{6}{5}$ ,  $(-5, -2)$   
 6.  $m: 0.5$ ,  $(7, -3)$       7.  $m: -1.3$ ,  $(-4, 4)$

Write an equation in slope-intercept form for each line.

8.  $b$       9.  $c$   
 10. parallel to line  $b$ , contains  $(3, -2)$   
 11. perpendicular to line  $c$ , contains  $(-2, -4)$



Write an equation in slope-intercept form for the line that satisfies the given conditions.

12.  $m = -\frac{4}{9}$ ,  $y$ -intercept = 2      13.  $m = 3$ , contains  $(2, -3)$   
 14.  $x$ -intercept is  $-6$ ,  $y$ -intercept is 2      15.  $x$ -intercept is 2,  $y$ -intercept is  $-5$   
 16. passes through  $(2, -4)$  and  $(5, 8)$       17. contains  $(-4, 2)$  and  $(8, -1)$

18. **COMMUNITY EDUCATION** A local community center offers self-defense classes for teens. A \$25 enrollment fee covers supplies and materials and open classes cost \$10 each. Write an equation to represent the total cost of  $x$  self-defense classes at the community center.

**5-4 Practice*****The Triangle Inequality***

Determine whether the given measures can be the lengths of the sides of a triangle. Write *yes* or *no*.

- |                  |                     |
|------------------|---------------------|
| 1. 9, 12, 18     | 2. 8, 9, 17         |
| 3. 14, 14, 19    | 4. 23, 26, 50       |
| 5. 32, 41, 63    | 6. 2.7, 3.1, 4.3    |
| 7. 0.7, 1.4, 2.1 | 8. 12.3, 13.9, 25.2 |

Find the range for the measure of the third side of a triangle given the measures of two sides.

- |               |               |
|---------------|---------------|
| 9. 6 and 19   | 10. 7 and 29  |
| 11. 13 and 27 | 12. 18 and 23 |
| 13. 25 and 38 | 14. 31 and 39 |
| 15. 42 and 6  | 16. 54 and 7  |

**ALGEBRA** Determine whether the given coordinates are the vertices of a triangle. Explain.

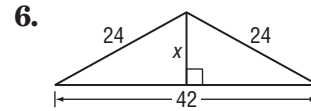
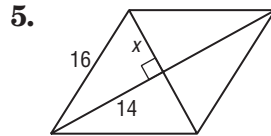
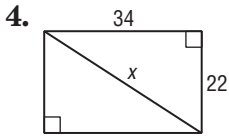
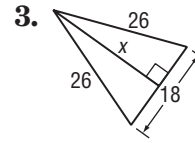
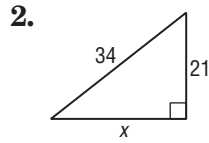
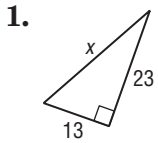
- |   |  |
|---|--|
| 17. $R(1, 3)$ , $S(4, 0)$ , $T(10, -6)$ | 18. $W(2, 6)$ , $X(1, 6)$ , $Y(4, 2)$  |
| 19. $P(-3, 2)$ , $L(1, 1)$ , $M(9, -1)$ | 20. $B(1, 1)$ , $C(6, 5)$ , $D(4, -1)$ |

- 21. GARDENING** Ha Poong has 4 lengths of wood from which he plans to make a border for a triangular-shaped herb garden. The lengths of the wood borders are 8 inches, 10 inches, 12 inches, and 18 inches. How many different triangular borders can Ha Poong make?

# 8-2 Practice

## The Pythagorean Theorem and Its Converse

Find  $x$ .



Determine whether  $\triangle GHI$  is a right triangle for the given vertices. Explain.

7.  $G(2, 7), H(3, 6), I(-4, -1)$

8.  $G(-6, 2), H(1, 12), I(-2, 1)$

9.  $G(-2, 1), H(3, -1), I(-4, -4)$

10.  $G(-2, 4), H(4, 1), I(-1, -9)$

Determine whether each set of measures can be the measures of the sides of a right triangle. Then state whether they form a Pythagorean triple.

11. 9, 40, 41

12. 7, 28, 29

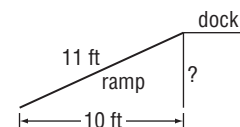
13. 24, 32, 40

14.  $\frac{9}{5}, \frac{12}{5}, 3$

15.  $\frac{1}{3}, \frac{2\sqrt{2}}{3}, 1$

16.  $\frac{\sqrt{4}}{7}, \frac{2\sqrt{3}}{7}, \frac{4}{7}$

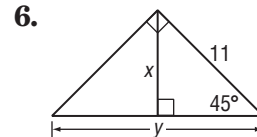
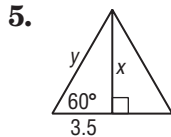
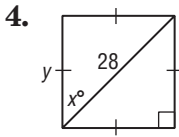
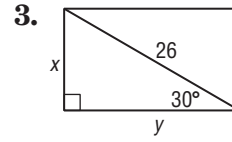
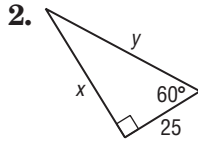
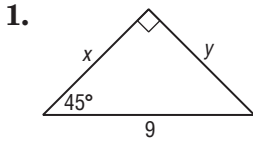
17. **CONSTRUCTION** The bottom end of a ramp at a warehouse is 10 feet from the base of the main dock and is 11 feet long. How high is the dock?



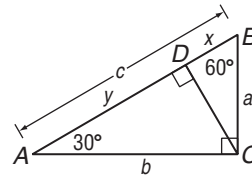
# 8-3 Practice

## Special Right Triangles

Find  $x$  and  $y$ .



For Exercises 7-9, use the figure at the right.



7. If  $a = 4\sqrt{3}$ , find  $b$  and  $c$ .

8. If  $x = 3\sqrt{3}$ , find  $a$  and  $CD$ .

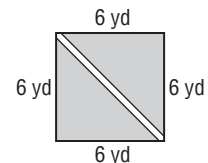
9. If  $a = 4$ , find  $CD$ ,  $b$ , and  $y$ .

10. The perimeter of an equilateral triangle is 39 centimeters. Find the length of an altitude of the triangle.

11.  $\triangle MIP$  is a  $30^\circ$ - $60^\circ$ - $90^\circ$  triangle with right angle at  $I$ , and  $\overline{IP}$  the longer leg. Find the coordinates of  $M$  in Quadrant I for  $I(3, 3)$  and  $P(12, 3)$ .

12.  $\triangle TJK$  is a  $45^\circ$ - $45^\circ$ - $90^\circ$  triangle with right angle at  $J$ . Find the coordinates of  $T$  in Quadrant II for  $J(-2, -3)$  and  $K(3, -3)$ .

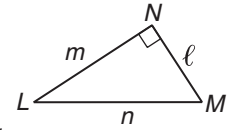
13. **BOTANICAL GARDENS** One of the displays at a botanical garden is an herb garden planted in the shape of a square. The square measures 6 yards on each side. Visitors can view the herbs from a diagonal pathway through the garden. How long is the pathway?



# 8-4 Practice

## Trigonometry

Use  $\triangle LMN$  to find  $\sin L$ ,  $\cos L$ ,  $\tan L$ ,  $\sin M$ ,  $\cos M$ , and  $\tan M$ . Express each ratio as a fraction and as a decimal to the nearest hundredth.



1.  $l = 15, m = 36, n = 39$

2.  $l = 12, m = 12\sqrt{3}, n = 24$

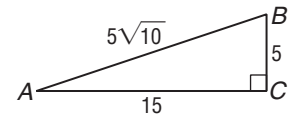
Use a calculator to find each value. Round to the nearest ten-thousandth.

3.  $\sin 72.5$

4.  $\tan 27.5$

5.  $\cos 64.8$

Use the figure to find each trigonometric ratio. Express answers as a fraction and as a decimal rounded to the nearest ten-thousandth.



6.  $\cos A$

7.  $\tan B$

8.  $\sin A$

Find the measure of each acute angle to the nearest tenth of a degree.

9.  $\sin B = 0.7823$

10.  $\tan A = 0.2356$

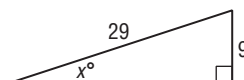
11.  $\cos R = 0.6401$

Find  $x$ . Round to the nearest tenth.

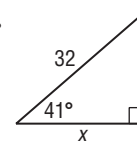
12.



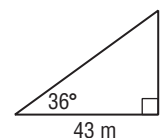
13.



14.



15. **GEOGRAPHY** Diego used a theodolite to map a region of land for his class in geomorphology. To determine the elevation of a vertical rock formation, he measured the distance from the base of the formation to his position and the angle between the ground and the line of sight to the top of the formation. The distance was 43 meters and the angle was 36 degrees. What is the height of the formation to the nearest meter?

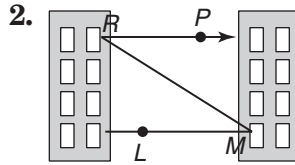
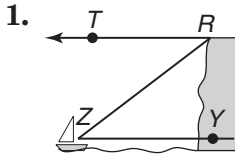




# 8-5 Practice

## Angles of Elevation and Depression

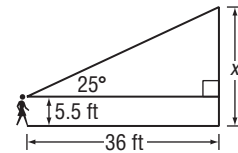
Name the angle of depression or angle of elevation in each figure.



**3. WATER TOWERS** A student can see a water tower from the closest point of the soccer field at San Lobos High School. The edge of the soccer field is about 110 feet from the water tower and the water tower stands at a height of 32.5 feet. What is the angle of elevation if the eye level of the student viewing the tower from the edge of the soccer field is 6 feet above the ground? Round to the nearest tenth degree.

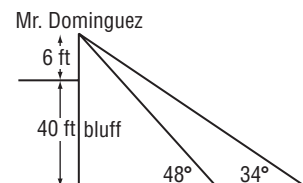
**4. CONSTRUCTION** A roofer props a ladder against a wall so that the top of the ladder reaches a 30-foot roof that needs repair. If the angle of elevation from the bottom of the ladder to the roof is  $55^\circ$ , how far is the ladder from the base of the wall? Round your answer to the nearest foot.

**5. TOWN ORDINANCES** The town of Belmont restricts the height of flagpoles to 25 feet on any property. Lindsay wants to determine whether her school is in compliance with the regulation. Her eye level is 5.5 feet from the ground and she stands 36 feet from the flagpole. If the angle of elevation is about  $25^\circ$ , what is the height of the flagpole to the nearest tenth foot?



**6. GEOGRAPHY** Stephan is standing on a mesa at the Painted Desert. The elevation of the mesa is about 1380 meters and Stephan's eye level is 1.8 meters above ground. If Stephan can see a band of multicolored shale at the bottom and the angle of depression is  $29^\circ$ , about how far is the band of shale from his eyes? Round to the nearest meter.

**7. INDIRECT MEASUREMENT** Mr. Dominguez is standing on a 40-foot ocean bluff near his home. He can see his two dogs on the beach below. If his line of sight is 6 feet above the ground and the angles of depression to his dogs are  $34^\circ$  and  $48^\circ$ , how far apart are the dogs to the nearest foot?



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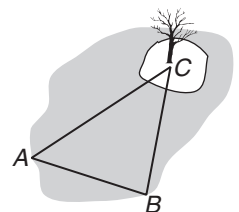
**8-6 Practice*****The Law of Sines***

Find each measure using the given measures from  $\triangle EFG$ . Round angle measures to the nearest tenth degree and side measures to the nearest tenth.

- If  $m\angle G = 14$ ,  $m\angle E = 67$ , and  $e = 14$ , find  $g$ .
- If  $e = 12.7$ ,  $m\angle E = 42$ , and  $m\angle F = 61$ , find  $f$ .
- If  $g = 14$ ,  $f = 5.8$ , and  $m\angle G = 83$ , find  $m\angle F$ .
- If  $e = 19.1$ ,  $m\angle G = 34$ , and  $m\angle E = 56$ , find  $g$ .
- If  $f = 9.6$ ,  $g = 27.4$ , and  $m\angle G = 43$ , find  $m\angle F$ .

Solve each  $\triangle STU$  described below. Round measures to the nearest tenth.

- $m\angle T = 85$ ,  $s = 4.3$ ,  $t = 8.2$
- $s = 40$ ,  $u = 12$ ,  $m\angle S = 37$
- $m\angle U = 37$ ,  $t = 2.3$ ,  $m\angle T = 17$
- $m\angle S = 62$ ,  $m\angle U = 59$ ,  $s = 17.8$
- $t = 28.4$ ,  $u = 21.7$ ,  $m\angle T = 66$
- $m\angle S = 89$ ,  $s = 15.3$ ,  $t = 14$
- $m\angle T = 98$ ,  $m\angle U = 74$ ,  $u = 9.6$
- $t = 11.8$ ,  $m\angle S = 84$ ,  $m\angle T = 47$
- INDIRECT MEASUREMENT** To find the distance from the edge of the lake to the tree on the island in the lake, Hannah set up a triangular configuration as shown in the diagram. The distance from location  $A$  to location  $B$  is 85 meters. The measures of the angles at  $A$  and  $B$  are  $51^\circ$  and  $83^\circ$ , respectively. What is the distance from the edge of the lake at  $B$  to the tree on the island at  $C$ ?



**8-7 Practice****The Law of Cosines**

In  $\triangle JKL$ , given the following measures, find the measure of the missing side. Round to the nearest tenth.

- $j = 1.3, k = 10, m\angle L = 77$
- $j = 9.6, \ell = 1.7, m\angle K = 43$
- $j = 11, k = 7, m\angle L = 63$
- $k = 4.7, \ell = 5.2, m\angle J = 112$

In  $\triangle MNQ$ , given the lengths of the sides, find the measure of the stated angle to the nearest tenth.

- $m = 17, n = 23, q = 25; m\angle Q$
- $m = 24, n = 28, q = 34; m\angle M$
- $m = 12.9, n = 18, q = 20.5; m\angle N$
- $m = 23, n = 30.1, q = 42; m\angle Q$

Determine whether the Law of Sines or the Law of Cosines should be used first to solve  $\triangle ABC$ . Then solve each triangle. Round angle measures to the nearest degree and side measure to the nearest tenth.

- |                                      |  |
|--------------------------------------|--|
| 9. $a = 13, b = 18, c = 19$          | 10. $a = 6, b = 19, m\angle C = 38$    |
| 11. $a = 17, b = 22, m\angle B = 49$ | 12. $a = 15.5, b = 18, m\angle C = 72$ |

Solve each  $\triangle FGH$  described below. Round measures to the nearest tenth.

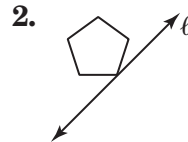
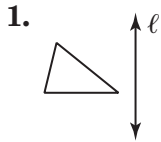
- $m\angle F = 54, f = 12.5, g = 11$
- $f = 20, g = 23, m\angle H = 47$
- $f = 15.8, g = 11, h = 14$
- $f = 36, h = 30, m\angle G = 54$

17. **REAL ESTATE** The Esposito family purchased a triangular plot of land on which they plan to build a barn and corral. The lengths of the sides of the plot are 320 feet, 286 feet, and 305 feet. What are the measures of the angles formed on each side of the property?

# 9-1 Practice

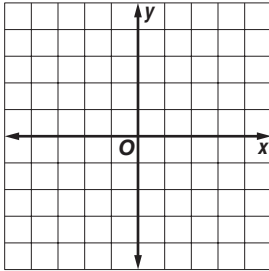
## Reflections

Draw the image of each figure under a reflection in line  $\ell$ .

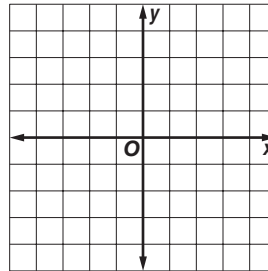


**COORDINATE GEOMETRY** Graph each figure and its image under the given reflection.

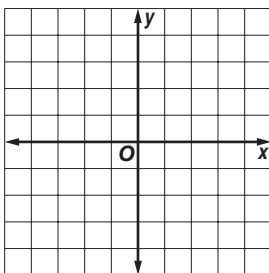
3. quadrilateral  $ABCD$  with vertices  $A(-3, 3)$ ,  $B(1, 4)$ ,  $C(4, 0)$ , and  $D(-3, -3)$  in the origin



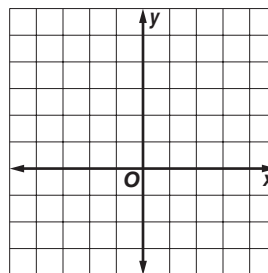
4.  $\triangle FGH$  with vertices  $F(-3, -1)$ ,  $G(0, 4)$ , and  $H(3, -1)$  in the line  $y = x$



5. rectangle  $QRST$  with vertices  $Q(-3, 2)$ ,  $R(-1, 4)$ ,  $S(2, 1)$ , and  $T(0, -1)$  in the  $x$ -axis



6. trapezoid  $HIJK$  with vertices  $H(-2, 5)$ ,  $I(2, 5)$ ,  $J(-4, -1)$ , and  $K(-4, 3)$  in the  $y$ -axis



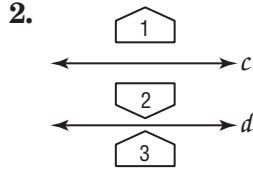
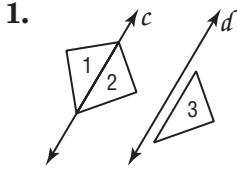
**ROAD SIGNS** Determine how many lines of symmetry each sign has. Then determine whether the sign has point symmetry.



# 9-2 Practice

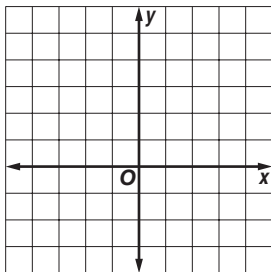
## Translations

In each figure,  $c \parallel d$ . Determine whether Figure 3 is a translation image of Figure 1. Write *yes* or *no*. Explain your answer.

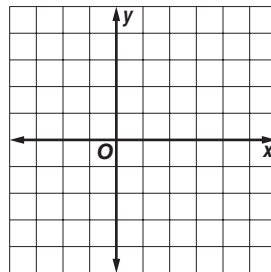


**COORDINATE GEOMETRY** Graph each figure and its image under the given translation.

3. quadrilateral  $TUWX$  with vertices  $T(-1, 1)$ ,  $U(4, 2)$ ,  $W(1, 5)$ , and  $X(-1, 3)$  under the translation  $(x, y) \rightarrow (x - 2, y - 4)$

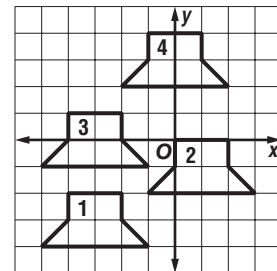


4. pentagon  $DEFGH$  with vertices  $D(-1, -2)$ ,  $E(2, -1)$ ,  $F(5, -2)$ ,  $G(4, -4)$ ,  $H(1, -4)$  under the translation  $(x, y) \rightarrow (x - 1, y + 5)$



**ANIMATION** Find the translation that moves the figure on the coordinate plane.

5. figure 1  $\rightarrow$  figure 2
6. figure 2  $\rightarrow$  figure 3
7. figure 3  $\rightarrow$  figure 4

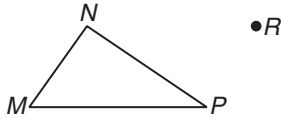


# 9-3 Practice

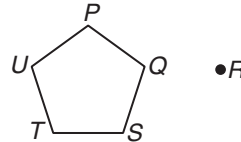
## Rotations

Rotate each figure about point  $R$  under the given angle of rotation and the given direction. Label the vertices of the rotation image.

1.  $80^\circ$  counterclockwise

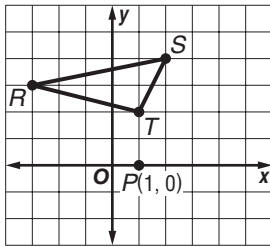


2.  $100^\circ$  clockwise

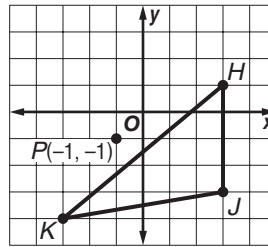


**COORDINATE GEOMETRY** Draw the rotation image of each figure  $90^\circ$  in the given direction about the center point and label the coordinates.

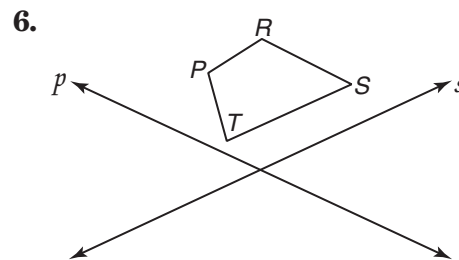
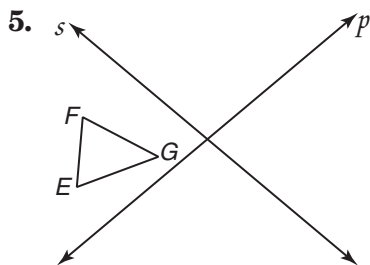
3.  $\triangle RST$  with vertices  $R(-3, 3)$ ,  $S(2, 4)$ , and  $T(1, 2)$  clockwise about the point  $P(1, 0)$



4.  $\triangle HJK$  with vertices  $H(3, 1)$ ,  $J(3, -3)$ , and  $K(-3, -4)$  counterclockwise about the point  $P(-1, -1)$



Use a composition of reflections to find the rotation image with respect to lines  $p$  and  $s$ . Then find the angle of rotation for each image.

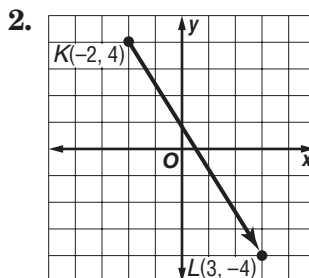
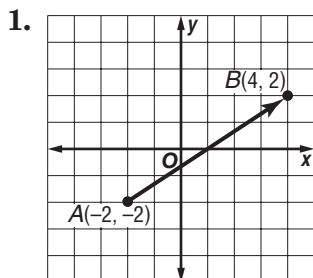


7. **STEAMBOATS** A paddle wheel on a steamboat is driven by a steam engine that rotates the paddles attached to the wheel to propel the boat through the water. If a paddle wheel consists of 18 evenly spaced paddles, identify the order and magnitude of its rotational symmetry.

# 9-6 Practice

## Vectors

Write the component form of each vector.



Find the magnitude and direction of  $\overrightarrow{FG}$  for the given coordinates. Round to the nearest tenth.

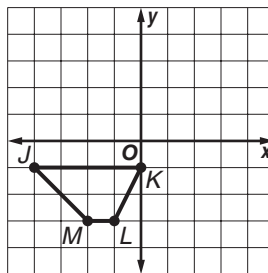
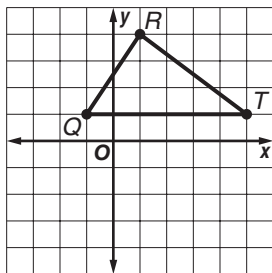
3.  $F(-8, -5), G(-2, 7)$

4.  $F(-4, 1), G(5, -6)$

Graph the image of each figure under a translation by the given vector(s).

5.  $\triangle QRT$  with vertices  $Q(-1, 1), R(1, 4), T(5, 1)$ ;  $\vec{s} = \langle -2, -5 \rangle$

6. trapezoid with vertices  $J(-4, -1), K(0, -1), L(-1, -3), M(-2, -3)$ ;  $\vec{c} = \langle 5, 4 \rangle$  and  $\vec{d} = \langle -2, 1 \rangle$



Find the magnitude and direction of each resultant for the given vectors.

7.  $\vec{a} = \langle -6, 4 \rangle, \vec{b} = \langle 4, 6 \rangle$

8.  $\vec{e} = \langle -4, -5 \rangle, \vec{f} = \langle -1, 3 \rangle$

**AVIATION** For Exercises 9 and 10, use the following information.

A jet begins a flight along a path due north at 300 miles per hour. A wind is blowing due west at 30 miles per hour.

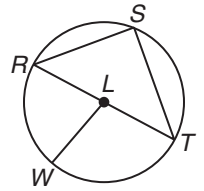
9. Find the resultant velocity of the plane.

10. Find the resultant direction of the plane.

# 10-1 Practice

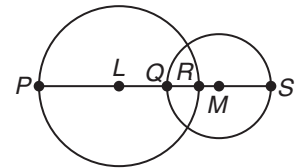
## Circles and Circumference

For Exercises 1–7, refer to the circle at the right.



1. Name the circle.
2. Name a radius.
3. Name a chord.
4. Name a diameter.
5. Name a radius not drawn as part of a diameter.
6. Suppose the radius of the circle is 3.5 yards. Find the diameter.
7. If  $RT = 19$  meters, find  $LW$ .

The diameters of  $\odot L$  and  $\odot M$  are 20 and 13 units, respectively. Find each measure if  $QR = 4$ .



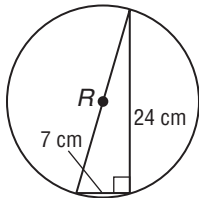
8.  $LQ$
9.  $RM$

The radius, diameter, or circumference of a circle is given. Find the missing measures to the nearest hundredth.

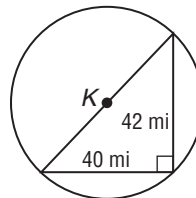
10.  $r = 7.5$  mm  
 $d =$  \_\_\_\_\_,  $C \approx$  \_\_\_\_\_
11.  $C = 227.6$  yd  
 $d \approx$  \_\_\_\_\_,  $r \approx$  \_\_\_\_\_

Find the exact circumference of each circle.

12.



13.



**SUNDIALS** For Exercises 14 and 15, use the following information.

Herman purchased a sundial to use as the centerpiece for a garden. The diameter of the sundial is 9.5 inches.

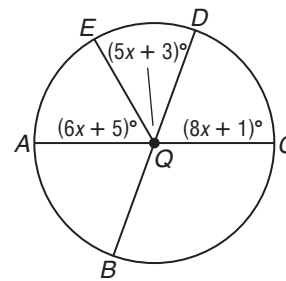
14. Find the radius of the sundial.
15. Find the circumference of the sundial to the nearest hundredth.



# 10-2 Practice

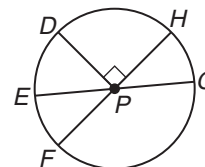
## Measuring Angles and Arcs

**ALGEBRA** In  $\odot Q$ ,  $\overline{AC}$  and  $\overline{BD}$  are diameters. Find each measure.



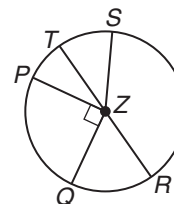
1.  $m\angle AQE$
2.  $m\angle DQE$
3.  $m\angle CQD$
4.  $m\angle BQC$
5.  $m\angle CQE$
6.  $m\angle AQD$

In  $\odot P$ ,  $m\angle GPH = 38$ . Find each measure.



7.  $m\widehat{EF}$
8.  $m\widehat{DE}$
9.  $m\widehat{FG}$
10.  $m\widehat{DHG}$
11.  $m\widehat{DFG}$
12.  $m\widehat{DGE}$

The radius of  $\odot Z$  is 13.5 units long. Find the length of each arc for the given angle measure.



13.  $\widehat{QPT}$  if  $m\angle QZT = 120$
14.  $\widehat{QR}$  if  $m\angle QZR = 60$
15.  $\widehat{PQR}$  if  $m\angle PZR = 150$
16.  $\widehat{QPS}$  if  $m\angle QZS = 160$

**HOMEWORK** For Exercises 17 and 18, refer to the table, which shows the number of hours students at Leland High School say they spend on homework each night.

Homework	
Less than 1 hour	8%
1–2 hours	29%
2–3 hours	58%
3–4 hours	3%
Over 4 hours	2%

17. If you were to construct a circle graph of the data, how many degrees would be allotted to each category?
18. Describe the arcs associated with each category.

# 10-3 Practice

## Arcs and Chords

In  $\odot E$ ,  $m\widehat{HQ} = 48$ ,  $HI = JK$ , and  $JR = 7.5$ . Find each measure.

1.  $m\widehat{HI}$

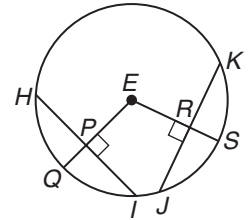
2.  $m\widehat{QI}$

3.  $m\widehat{JK}$

4.  $HI$

5.  $PI$

6.  $JK$



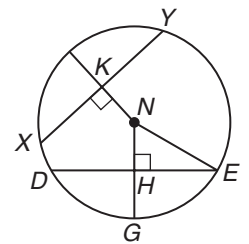
The radius of  $\odot N$  is 18,  $NK = 9$ , and  $m\widehat{DE} = 120$ . Find each measure.

7.  $m\widehat{GE}$

8.  $m\angle HNE$

9.  $m\angle HEN$

10.  $HN$



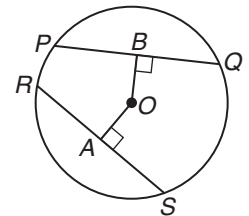
The radius of  $\odot O = 32$ ,  $\widehat{PQ} \cong \widehat{RS}$ , and  $PQ = 56$ . Find each measure.

11.  $PB$

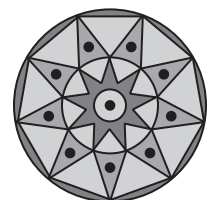
14.  $BQ$

12.  $OB$

16.  $RS$



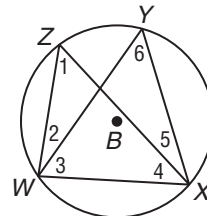
**13. MANDALAS** The base figure in a mandala design is a nine-pointed star. Find the measure of each arc of the circle circumscribed about the star.



# 10-4 Practice

## Inscribed Angles

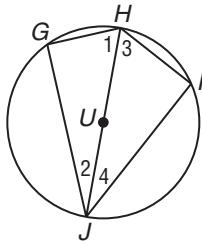
In  $\odot B$ ,  $m\widehat{WX} = 104$ ,  $m\widehat{WZ} = 88$ , and  $m\angle ZWY = 26$ . Find the measure of each angle.



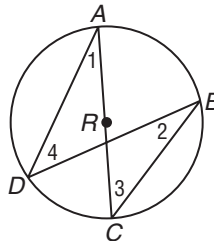
1.  $m\angle 1$
2.  $m\angle 2$
3.  $m\angle 3$
4.  $m\angle 4$
5.  $m\angle 5$
6.  $m\angle 6$

**ALGEBRA** Find the measure of each numbered angle for each figure.

7.  $m\angle 1 = 5x + 2$ ,  $m\angle 2 = 2x - 3$   
 $m\angle 3 = 7y - 1$ ,  $m\angle 4 = 2y + 10$

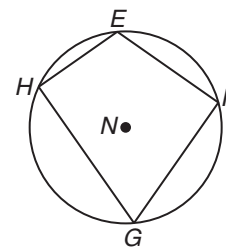


8.  $m\angle 1 = 4x - 7$ ,  $m\angle 2 = 2x + 11$ ,  
 $m\angle 3 = 5y - 14$ ,  $m\angle 4 = 3y + 8$

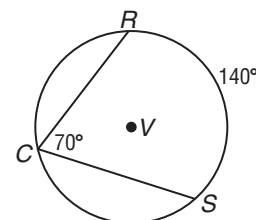


Quadrilateral  $EFGH$  is inscribed in  $\odot N$  such that  $m\widehat{FG} = 97$ ,  $m\widehat{GH} = 117$ , and  $m\widehat{EHG} = 164$ . Find each measure.

9.  $m\angle E$
10.  $m\angle F$
11.  $m\angle G$
12.  $m\angle H$



**13. PROBABILITY** In  $\odot V$ , point  $C$  is randomly located so that it does not coincide with points  $R$  or  $S$ . If  $m\widehat{RS} = 140$ , what is the probability that  $m\angle RCS = 70$ ?

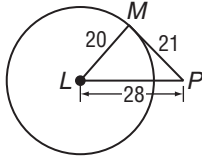


# 10-5 Practice

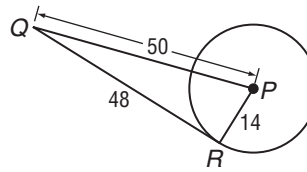
## Tangents

Determine whether each segment is tangent to the given circle.

1.  $\overline{MP}$

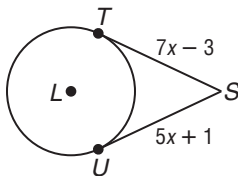


2.  $\overline{QR}$

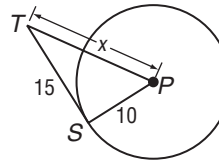


Find  $x$ . Assume that segments that appear to be tangent are tangent.

3.

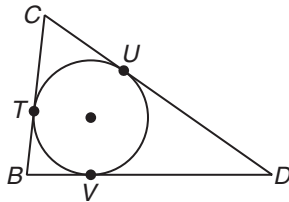


4.

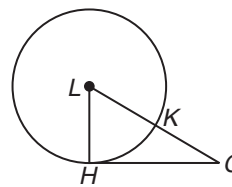


Find the perimeter of each polygon for the given information. Assume that segments that appear to be tangent are tangent.

5.  $CD = 52$ ,  $CU = 18$ ,  $TB = 12$

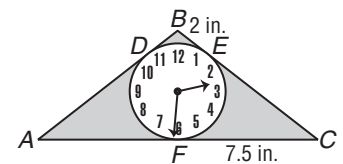


6.  $KG = 32$ ,  $HG = 56$



**CLOCKS** For Exercises 7 and 8, use the following information.

The design shown in the figure is that of a circular clock face inscribed in a triangular base.  $AF$  and  $FC$  are equal.



7. Find  $AB$ .

8. Find the perimeter of the clock.