

Study Guide: Review

Know it!
Note

For a complete list of the postulates, theorems in this chapter see p. S82.

Vocabulary

acute angle.....	21	diameter.....	37	plane.....	
adjacent angles.....	28	distance.....	13	point.....	
angle.....	20	endpoint.....	7	postulate.....	
angle bisector.....	23	exterior of an angle.....	20	preimage.....	
area.....	36	height.....	36	radius.....	
base.....	36	hypotenuse.....	45	ray.....	
between.....	14	image.....	50	reflection.....	
bisect.....	15	interior of an angle.....	20	right angle.....	
circumference.....	37	leg.....	45	rotation.....	
collinear.....	6	length.....	13	segment.....	
complementary angles.....	29	line.....	6	segment bisector.....	
congruent angles.....	22	linear pair.....	28	straight angle.....	
congruent segments.....	13	measure.....	20	supplementary angles.....	
construction.....	14	midpoint.....	15	transformation.....	
coordinate.....	13	obtuse angle.....	21	translation.....	
coordinate plane.....	43	opposite rays.....	7	undefined term.....	
coplanar.....	6	perimeter.....	36	vertex.....	
degree.....	20	pi.....	37	vertical angles.....	

Complete the sentences below with vocabulary words from the list above.

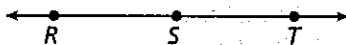
1. A(n) ? divides an angle into two congruent angles.
2. ? are two angles whose measures have a sum of 90° .
3. The length of the longest side of a right triangle is called the ? .

Practice
the circled
problems

1-1 Understanding Points, Lines, and Planes (pp. 6–11)

EXAMPLES

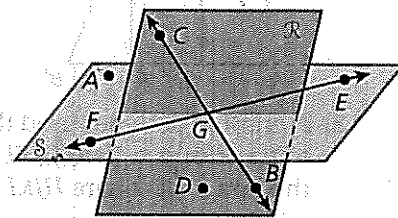
- Name the common endpoint of $\overrightarrow{SR}$ and $\overrightarrow{ST}$.



$\overrightarrow{SR}$ and $\overrightarrow{ST}$ are opposite rays with common endpoint S.

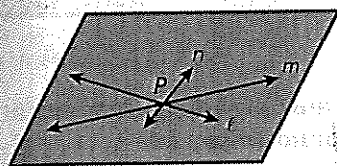
EXERCISES

Name each of the following.



4. four coplanar points
5. line containing B and C
6. plane that contains A, G, and E

Draw and label three coplanar lines intersecting in one point.



Draw and label each of the following.

7. line containing P and Q
8. pair of opposite rays both containing C
9. $\overleftrightarrow{CD}$ intersecting plane P at B

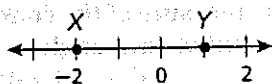
1-2 Measuring and Constructing Segments (pp. 13-19)



EXAMPLES

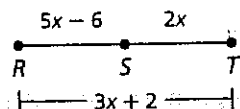
- Find the length of $\overline{XY}$.

$$\begin{aligned} XY &= |-2 - 1| \\ &= |-3| = 3 \end{aligned}$$



- S is between R and T. Find RT.

$$\begin{aligned} RT &= RS + ST \\ 3x + 2 &= 5x - 6 + 2x \\ 3x + 2 &= 7x - 6 \\ x &= 2 \\ RT &= 3(2) + 2 = 8 \end{aligned}$$

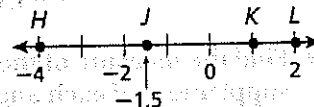


EXERCISES

Find each length.

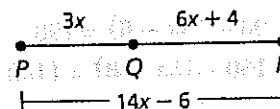
10. JL

11. HK



12. Y is between X and Z, $XY = 13.8$, and $XZ = 21.4$. Find YZ.

13. Q is between P and R. Find PR.



14. U is the midpoint of $\overline{TV}$, $TU = 3x + 4$, and $UV = 5x - 2$. Find TU, UV, and TV.

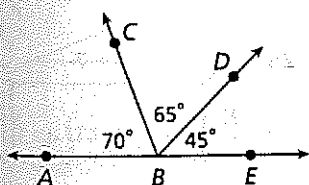
15. E is the midpoint of $\overline{DF}$, $DE = 9x$, and $EF = 4x + 10$. Find DE, EF, and DF.

1-3 Measuring and Constructing Angles (pp. 20-27)



EXAMPLES

- Classify each angle as acute, right, or obtuse.



$\angle ABC$ acute;
 $\angle CBD$ acute;
 $\angle ABD$ obtuse;
 $\angle DBE$ acute;
 $\angle CBE$ obtuse

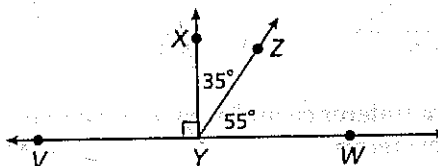
- $\overline{KM}$ bisects $\angle JKL$, $m\angle JKM = (3x + 4)^\circ$, and $m\angle MKL = (6x - 5)^\circ$. Find $m\angle JKL$.

$$\begin{aligned} 3x + 4 &= 6x - 5 && \text{Def. of } \angle \text{ bisector} \\ 3x + 9 &= 6x && \text{Add 5 to both sides.} \\ 9 &= 3x && \text{Subtract } 3x \text{ from both sides.} \\ x &= 3 && \text{Divide both sides by 3.} \end{aligned}$$

$$\begin{aligned} m\angle JKL &= 3x + 4 + 6x - 5 \\ &= 9x - 1 \\ &= 9(3) - 1 = 26^\circ \end{aligned}$$

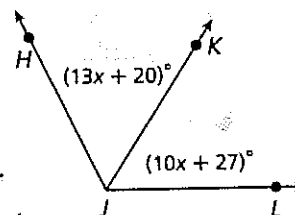
EXERCISES

16. Classify each angle as acute, right, or obtuse.



17. $m\angle HJL = 116^\circ$. Find $m\angle HJK$.

18. $\overrightarrow{NP}$ bisects $\angle MNQ$, $m\angle MNP = (6x - 12)^\circ$, and $m\angle PNQ = (4x + 8)^\circ$. Find $m\angle MNQ$.

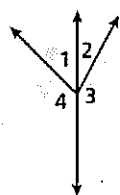


1-4 Pairs of Angles (pp. 28-33)

Prep for 13.0

EXAMPLES

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



$\angle 1$ and $\angle 2$ are only adjacent.
 $\angle 2$ and $\angle 4$ are not adjacent.
 $\angle 2$ and $\angle 3$ are adjacent and form a linear pair.
 $\angle 1$ and $\angle 4$ are adjacent and form a linear pair.

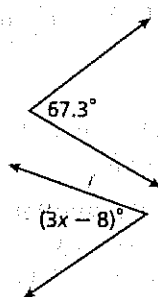
- Find the measure of the complement and supplement of each angle.

$$90 - 67.3 = 22.7^\circ$$

$$180 - 67.3 = 112.7^\circ$$

$$90 - (3x - 8) = (98 - 3x)^\circ$$

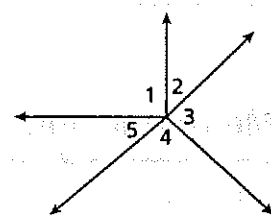
$$180 - (3x - 8) = (188 - 3x)^\circ$$



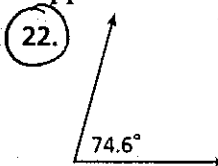
EXERCISES

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

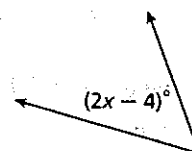
19. $\angle 1$ and $\angle 2$
 20. $\angle 3$ and $\angle 4$
 21. $\angle 2$ and $\angle 5$



Find the measure of the complement and supplement of each angle.



23.



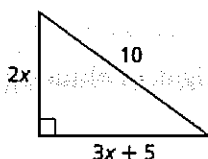
24. An angle measures 5 degrees more than 4 times its complement. Find the measure of the angle.

1-5 Using Formulas in Geometry (pp. 36-41)

8.0

EXAMPLES

- Find the perimeter and area of the triangle.



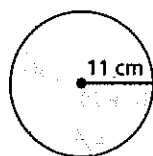
$$P = 2x + 3x + 5 + 10$$

$$= 5x + 15$$

$$A = \frac{1}{2}(3x + 5)(2x)$$

$$= 3x^2 + 5x$$

- Find the circumference and area of the circle to the nearest tenth.



$$C = 2\pi r$$

$$= 2\pi(11)$$

$$= 22\pi$$

$$\approx 69.1 \text{ cm}$$

$$A = \pi r^2$$

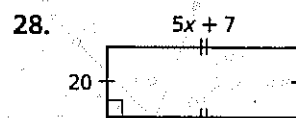
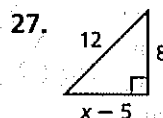
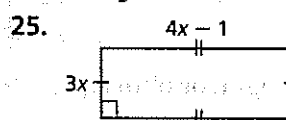
$$= \pi(11)^2$$

$$= 121\pi$$

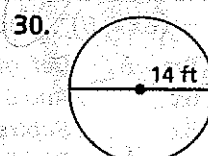
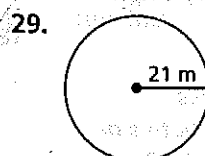
$$\approx 380.1 \text{ cm}^2$$

EXERCISES

Find the perimeter and area of each figure.



Find the circumference and area of each circle to the nearest tenth.



31. The area of a triangle is 102 m^2 . The base of the triangle is 17 m. What is the height of the triangle?

1-6 Midpoint and Distance in the Coordinate Plane (pp. 43-49)



Prep for 17.0, 15.0

EXAMPLES

- X is the midpoint of $\overline{CD}$. C has coordinates $(-4, 1)$, and X has coordinates $(3, -2)$.

Find the coordinates of D .

$$(3, -2) = \left(\frac{-4 + x}{2}, \frac{1 + y}{2} \right)$$

$$3 = \frac{-4 + x}{2}$$

$$6 = -4 + x$$

$$10 = x$$

$$-2 = \frac{1 + y}{2}$$

$$-4 = 1 + y$$

$$-5 = y$$

The coordinates of D are $(10, -5)$.

- Use the Distance Formula and the Pythagorean Theorem to find the distance, to the nearest tenth, from $(1, 6)$ to $(4, 2)$.

$$d = \sqrt{(4 - 1)^2 + (2 - 6)^2} \quad c^2 = a^2 + b^2$$

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

$$= \sqrt{9 + 16} \quad = 9 + 16 = 25$$

$$= \sqrt{25} \quad c = \sqrt{25}$$

$$= 5.0 \quad = 5.0$$

EXERCISES

Y is the midpoint of $\overline{AB}$. Find the missing coordinates of each point.

32. $A(3, 2)$; $B(-1, 4)$; $Y(\quad, \quad)$

33. $A(5, 0)$; $B(\quad, \quad)$; $Y(-2, 3)$

34. $A(\quad, \quad)$; $B(-4, 4)$; $Y(-2, 3)$

Use the Distance Formula and the Pythagorean Theorem to find the distance, to the nearest tenth, between each pair of points.

35. $X(-2, 4)$ and $Y(6, 1)$

36. $H(0, 3)$ and $K(-2, -4)$

37. $L(-4, 2)$ and $M(3, -2)$

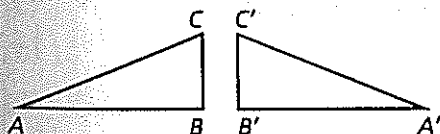
1-7 Transformations in the Coordinate Plane (pp. 50-55)



22.0

EXAMPLES

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



The transformation is a reflection.

$$\triangle ABC \rightarrow \triangle A'B'C'$$

- The coordinates of the vertices of rectangle $HJKL$ are $H(2, -1)$, $J(5, -1)$, $K(5, -3)$, and $L(2, -3)$. Find the coordinates of the image of rectangle $HJKL$ after the translation $(x, y) \rightarrow (x - 4, y + 1)$.

$$H' = (2 - 4, -1 + 1) = H'(-2, 0)$$

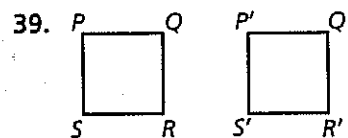
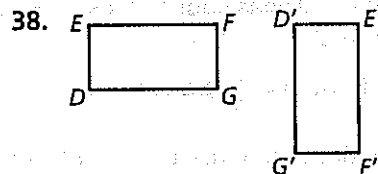
$$J' = (5 - 4, -1 + 1) = J'(1, 0)$$

$$K' = (5 - 4, -3 + 1) = K'(1, -2)$$

$$L' = (2 - 4, -3 + 1) = L'(-2, -2)$$

EXERCISES

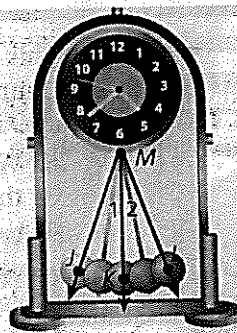
Identify each transformation. Then use arrow notation to describe the transformation.



40. The coordinates for the vertices of $\triangle XYZ$ are $X(-5, -4)$, $Y(-3, -1)$, and $Z(-2, -2)$. Find the coordinates for the image of $\triangle XYZ$ after the translation $(x, y) \rightarrow (x + 4, y + 5)$.

PRACTICE AND PROBLEM SOLVING

- 11. Physics** Pendulum clocks have been used since 1656 to keep time. The pendulum swings back and forth once or twice per second. Name all of the angles in the diagram.



Use the protractor to find the measure of each angle. Then classify each as acute, right, or obtuse.

12. $\angle CGE$ 13. $\angle BGD$ 14. $\angle AGB$

T is in the interior of $\angle RSU$. Find each of the following.

15. $m\angle RSU$ if $m\angle RST = 38^\circ$ and $m\angle TSU = 28.6^\circ$
 16. $m\angle RST$ if $m\angle TSU = 46.7^\circ$ and $m\angle RSU = 83.5^\circ$

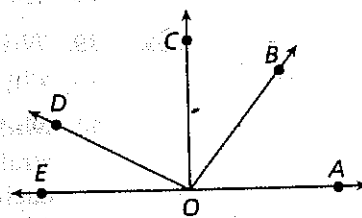
Multi-Step $\overrightarrow{SP}$ bisects $\angle RST$. Find each of the following.

17. $m\angle RST$ if $m\angle RSP = (3x - 2)^\circ$ and $m\angle PST = (9x - 26)^\circ$
 18. $m\angle RSP$ if $m\angle RST = \frac{5}{2}y^\circ$ and $m\angle PST = (y + 5)^\circ$

Estimation Use the following information for Exercises 19–22.

Assume the corner of a sheet of paper is a right angle. Use the corner to estimate the measure and classify each angle in the diagram.

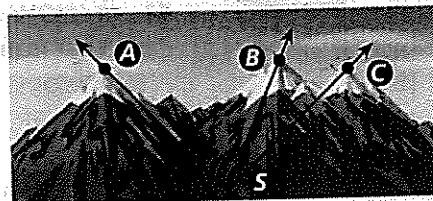
19. $\angle BOA$ 20. $\angle COA$
 21. $\angle EOD$ 22. $\angle EOB$



Use a protractor to draw an angle with each of the following measures.

23. 33° 24. 142° 25. 90° 26. 168°

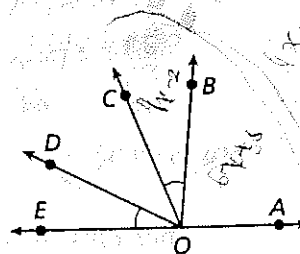
- 27. Surveying** A surveyor at point S discovers that the angle between peaks A and B is 3 times as large as the angle between peaks B and C . The surveyor knows that $\angle ASC$ is a right angle. Find $m\angle ASB$ and $m\angle BSC$.



- 28. Math History** As far back as the 5th century B.C., mathematicians have been fascinated by the problem of trisecting an angle. It is possible to construct an angle with $\frac{1}{4}$ the measure of a given angle. Explain how to do this.

Find the value of x .

29. $m\angle AOC = 7x - 2$, $m\angle DOC = 2x + 8$, $m\angle EOD = 27$
 30. $m\angle AOB = 4x - 2$, $m\angle BOC = 5x + 10$, $m\angle COD = 3x - 8$
 31. $m\angle AOB = 6x + 5$, $m\angle BOC = 4x - 2$; $m\angle AOC = 8x + 21$
 32. **Multi-Step** Q is in the interior of right $\angle PRS$. If $m\angle PRQ$ is 4 times as large as $m\angle QRS$, what is $m\angle PRQ$?

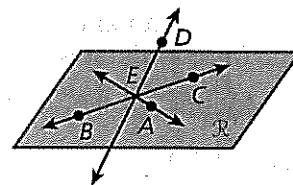


CHAPTER TEST

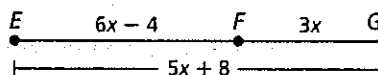
1. Draw and label plane N containing two lines that intersect at B .

Use the figure to name each of the following.

2. four noncoplanar points 3. line containing B and E
 4. The coordinate of A is -3 , and the coordinate of B is 0.5 . Find AB .



5. E , F , and G represent mile markers along a straight highway. Find EF .



6. J is the midpoint of $\overline{HK}$. Find HJ , JK , and HK .



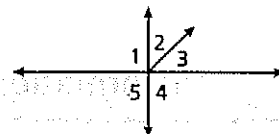
Classify each angle by its measure.

7. $m\angle LMP = 70^\circ$ 8. $m\angle QMN = 90^\circ$ 9. $m\angle PMN = 125^\circ$
 10. $\overline{TV}$ bisects $\angle RTS$. If the $m\angle RTV = (16x - 6)^\circ$ and $m\angle VTS = (13x + 9)^\circ$, what is the $m\angle RTV$?
 11. An angle's measure is 5 degrees less than 3 times the measure of its supplement. Find the measure of the angle and its supplement.

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

12. $\angle 2$ and $\angle 3$ 13. $\angle 4$ and $\angle 5$ 14. $\angle 1$ and $\angle 4$

15. Find the perimeter and area of a rectangle with $b = 8$ ft and $h = 4$ ft.

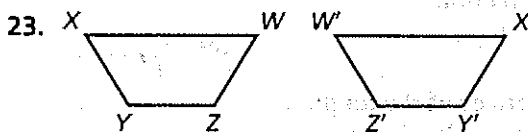
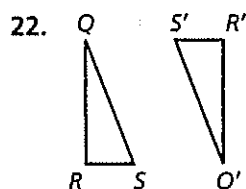


Find the circumference and area of each circle to the nearest tenth.

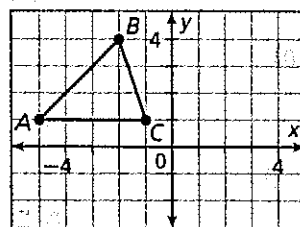
16. $r = 15$ m 17. $d = 25$ ft 18. $d = 2.8$ cm

19. Find the midpoint of the segment with endpoints $(-4, 6)$ and $(3, 2)$.
 20. M is the midpoint of $\overline{LN}$. M has coordinates $(-5, 1)$, and L has coordinates $(2, 4)$. Find the coordinates of N .
 21. Given $A(-5, 1)$, $B(-1, 3)$, $C(1, 4)$, and $D(4, 1)$, is $\overline{AB} \cong \overline{CD}$? Explain.

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



24. A designer used the translation $(x, y) \rightarrow (x + 3, y - 3)$ to transform a triangular-shaped pin ABC . Find the coordinates and draw the image of $\triangle ABC$.



More Ch. 1 Practice (Answers)

HOLT pg. 60-63

1. angle bisector

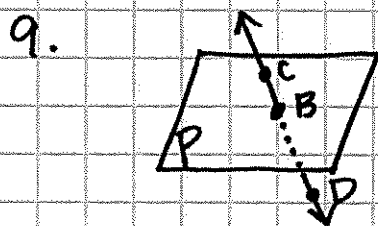
2. complementary angles

3. hypotenuse

4. A, F, E, G OR C, G, D, B

5. $\overleftrightarrow{GC}$

6. plane AEG



12. $YZ = 7.6$

13. $PR = 22$

14. $TU = 13$, $UN = 13$, $TN = 26$

17. $m\angle HJK = 59^\circ$

18. $m\angle MNQ = 96^\circ$

19. adjacent

20. adjacent and linear pair

21. not adjacent

22. complement is 15.4°

Supplement is 105.4°

24. 73°

32. $Y(1, 3)$

33. $B(-9, 6)$

35. $XY = \sqrt{73}$
 $XY \approx 8.54$

HOLT pg. 25

12. 90° , right

13. 93° , obtuse (95° OK)

14. 20° , acute

HOLT pg. 64

5. $EF = 14$

6. $HJ = 9$, $JK = 9$, $HK = 18$

7. acute

8. right

9. obtuse

10. $m\angle RTN = 74^\circ$

11. The angle is 133.75° and its supplement is 46.25°

19. $(-0.5, 4)$

20. $N(-12, -2)$