Skills Handbook Answers

Pg 834

1. 5

3. 3

5. $\frac{2}{3}$

7. $\frac{1}{2}$

9. -5

11. -12

13. $35 - 2x = 9$; 13

Pg 830

1. -50

3. 15

5. 2

7. 36

9. -2

11. 243

13. -20

15. -4

17. $2x + 3$

19. $-4x - 7$

21. $-4x^2 + 8x$

23. $-3t^2 + 4t$

25. $1 - 2r + r^2$

27. $7h - 1$

29. $2x^2 + 7x - 4$

31. $2y^2 - 3y$

Pg 829

1. 121

3. 26.01

5. -36

7. 10

9. 8.6

11. $\frac{2}{3}$

13. ± 7

15. ± 1

17. ± 6

19. ± 5

Chapter 1 Answers

Geometry
Lesson 1-3 - Practice and Problem-Solving Exercises Answers

8. 2

9. 9

10. 11

11. 6

12. 24

13. 25

14a. 7

14b. $RS = 60$, $ST = 36$, $RT = 96$

15. no

16. yes

17. yes

18. no

19a. 9

19b. $AY = 9$, $XY = 18$

20. 33

21. 34

22. 130

23. $\overline{XY} = 4$, $\overline{ZW} = 4$; congruent

24. $\overline{ZX} = 8$, $\overline{WY} = 8$; congruent

25. $YZ = 4$, $XW = 12$; not congruent

26. -2.5 or 2.5

27. -3.5 or 3.5

28. -6, 6, -1, or 1

29. -2 or 8

39. $y = 15$; $AC = 24$, $DC = 12$

40. $ED = 10$, $DB = 10$, $EB = 20$

43a. $(2x + 3) + (4x - 3) - x$ or $5x$

43b. $GH = 9$, $JK = 15$

6. $\angle XYZ$, $\angle ZYX$, $\angle Y$

7. $\angle ABC$, $\angle CBA$, $\angle B$, and $\angle 1$

8. $\angle JKM$, $\angle MKJ$, and $\angle 2$

9. 70, acute

10. 90, right

11. 110, obtuse

12. 25, acute

13. 85, acute

14. 20, acute

18. $\angle CBJ \cong \angle FHG$ (or $\angle DHG$)

19. $\angle FJH \cong \angle AJB$ (or $\angle BJA$)

20. 75

21. 130

22. $m\angle ABC = 45$, $m\angle DBC = 34$

23. $m\angle RQS = 43$, $m\angle TQS = 137$

29. 8

30. 18

31. A

Geometry
Lesson 1-5 - Practice and Problem-Solving Exercises Answers

7. Yes

8. No

9. No

10. No

11. $\angle AOB$ or $\angle DOC$

12. $m\angle AOE = 90$, so look for a right angle that also shares a vertex and a side and have no common interior points: $\angle EOC$

13. $\angle EOC$

14. Answers may vary. Sample: $\angle DOC$

15. Answers may vary. Sample: $\angle AOB$ and $\angle DOC$

16. Yes

17. No

18. No

19. Yes

20. Yes

21. No

22. Yes; they form a linear pair.

23. Yes; the angles are formed by two intersecting lines.

24. $\angle LMP$ and $\angle PMN$; $\angle LMQ$ and $\angle QMN$

25. $m\angle EFG = 69$ and $m\angle GFH = 111$

26a. $m\angle FGH = 30$

26b. 30

26c. 60

27. $m\angle ABC = 50$

28. $m\angle ABC = 48$

33. 90

34. 25

35. 155

36. 115

37a. 19.5

37b. $m\angle RQS = 43$ and $m\angle TQS = 137$

37c. Answers may vary. Sample: $m\angle RQS + m\angle TQS = 43 + 137 = 180$.

Name _____ Class _____ Date _____

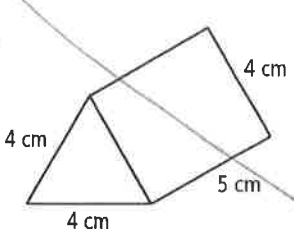
Extra Practice

Chapter 1

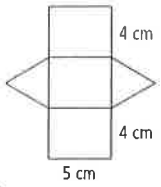
Lesson 1-1

Draw a net for each figure. Label the net with its dimensions.

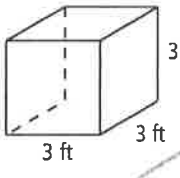
1.



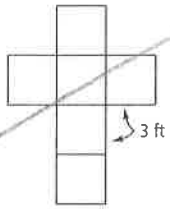
1.



2.

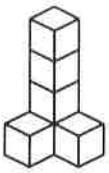


2.

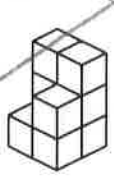


Make an isometric drawing of each cube structure on isometric dot paper. Then make an orthographic drawing.

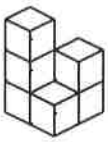
3.



4.



5.



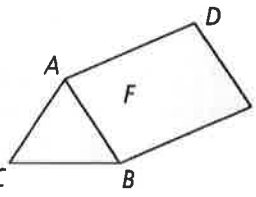
6. You can cut four of the lettered squares from the figure at the right and fold the remaining net to make a box that is open at one end. Write the letters of the squares you could remove to do this. List all the possibilities. **A, C, G, I; D, G, F, I; A, B, G, H; A, D, C, F; B, C, H, I; C, F, D, G; A, B, H, I**

A	B	C
D	E	F
G	H	I

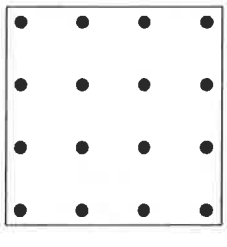
Lesson 1-2

Write *true* or *false*.

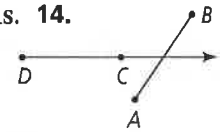
7. A, D, F are coplanar. **true**
8. $\overleftrightarrow{AC}$ and $\overleftrightarrow{FE}$ are coplanar. **false**
9. A, B, E are coplanar. **true**
10. D, A, B, E are coplanar. **true**
11. A and C are colinear. **true**
12. D, E, and B are collinear. **false**



13. How many sets of four collinear points are there in a 4-by-4 geoboard as pictured at the right? **10 sets**



14. $\overline{AB}$ and $\overline{CD}$ do not intersect but $\overrightarrow{DC}$ intersects $\overline{AB}$ in one point. Make a sketch that shows this. **14.**

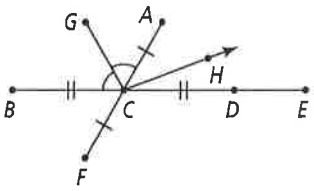


Lessons 1-3 and 1-4

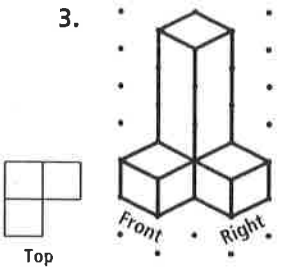
Use the figure at the right for Exercises 15–20.

15. If $BC = 12$ and $CE = 15$, then $BE =$ ☐. **27**

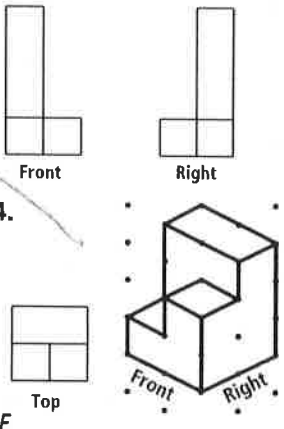
16. ☐ is the angle bisector of ☐. **$\overline{CG}$, $\angle BCA$**



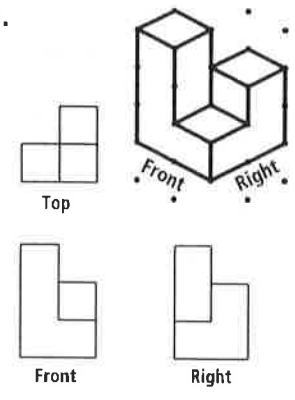
3.



4.



5.



Name _____ Class _____ Date _____

Extra Practice (continued)

Chapter 1

17. **Algebra** $BC = 3x + 2$ and $CD = 5x - 10$. Solve for x. **6**

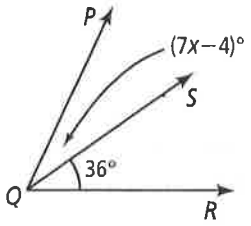
18. **Algebra** If $AC = 5x - 16$ and $CF = 2x - 4$, then $AF =$ ☐. **8**

19. $m\angle BCG = 60$, $m\angle GCA =$ ☐, and $m\angle BCA =$ ☐. **60, 120**

20. $m\angle ACD = 60$ and $m\angle DCH = 20$. Find $m\angle HCA$. **40**

21. **Algebra** In the figure at the right, $m\angle PQR = 4x + 47$. Find $m\angle PQS$. **31**

22. **Algebra** Points A, B, and C are collinear with B between A and C. $AB = 4x - 1$, $BC = 2x + 1$, and $AC = 8x - 4$. Find AB, BC, and AC. **7, 5, 12**



Lesson 1-5

Name the angle or angles in the diagram described by each of the following.

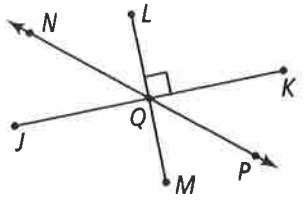
23. supplementary to $\angle NQK$ ***∠JQN, ∠KQP***

24. vertical to $\angle PQM$ ***∠LQN***

25. congruent to $\angle NQJ$ ***∠KQP***

26. adjacent and congruent to $\angle JQM$ ***∠MQK, ∠JQL***

27. complimentary to $\angle KQP$ ***∠PQM, ∠LQN***



28. $\angle XYZ$ and $\angle XYW$ are complementary angles. $m\angle XYZ = 3x + 9$ and $m\angle XYW = 5x + 9$. What are $m\angle XYZ$ and $m\angle XYW$? **36, 54**

29. $\angle ABC$ and $\angle DEF$ are supplementary angles. The measure of $\angle DEF$ is twenty degrees less than three times the measure of $\angle ABC$. What are $m\angle ABC$ and $m\angle DEF$? **50, 130**

30. $\overrightarrow{SQ}$ bisects $\angle RST$. $m\angle QST = 2x + 18$ and $m\angle RST = 6x - 2$. What is $m\angle RSQ$? **56**

Lesson 1-6

For Exercises 31–34, draw a diagram similar to the given one. Then do the construction. Check your work with a ruler or a protractor.

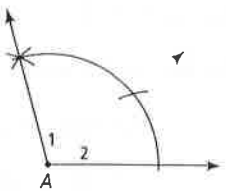
31. Construct $\angle A$ so that $m\angle A = m\angle 1 + m\angle 2$.

32. Construct the perpendicular bisector of $\overline{AB}$.

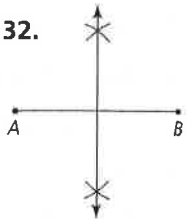
33. Construct the angle bisector of $\angle 1$.

34. Construct $\overline{FG}$ so that $FG = AB + CD$.

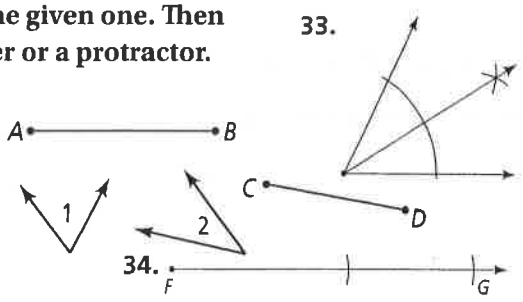
31.



32.



33.



Extra Practice (continued)

Chapter 1

Lesson 1-7

Find (a) the distance between the points to the nearest tenth.

(b) the coordinates of the midpoint of the segments with the given endpoints.

35. $A(2, 1), B(3, 0)$ **1.4;** $\left(\frac{5}{2}, \frac{1}{2}\right)$

36. $R(5, 2), S(-2, 4)$ **7.3;** $\left(\frac{3}{2}, 3\right)$

37. $Q(-7, -4), T(6, 10)$ **19.1;** $\left(-\frac{1}{2}, 3\right)$

38. $C(-8, -1), D(-5, -11)$ **10.4;** $\left(-\frac{13}{2}, -6\right)$

39. A map of a city and suburbs shows an airport located at $A(25, 11)$. An ambulance is on a straight expressway headed from the airport to Grant Hospital at $G(1, 1)$. The ambulance gets a flat tire at the midpoint M of $\overline{AG}$. As a result, the ambulance crew calls for helicopter assistance.

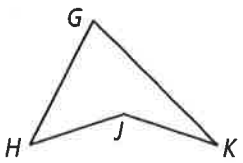
a. What are the coordinates of point M? **(13, 6)**

b. How far does the helicopter have to fly to get from M to G? Assume all coordinates are in miles. **13 mi**

Lesson 1-8

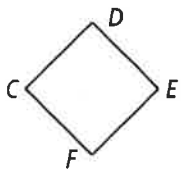
Name each polygon, then identify its sides and angles. Tell whether the polygon is convex or concave.

40.



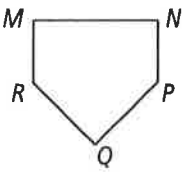
GHJK; $\overline{GH}, \overline{HJ}, \overline{JK}, \overline{KG}$; $\angle GHJ$, $\angle HJK$, $\angle JKG$, $\angle KGH$; convex

41.



CDEF; $\overline{CD}, \overline{DE}, \overline{EF}, \overline{FC}$; $\angle CDE$, $\angle DEF$, $\angle EFC$, $\angle FCD$; concave

42.

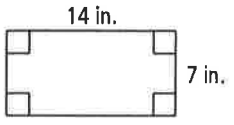


MNPQR; $\overline{MN}, \overline{NP}, \overline{PQ}, \overline{QR}, \overline{RM}$; $\angle MNP$, $\angle NPQ$, $\angle PQR$, $\angle QRM$, $\angle RMN$; convex

Lesson 1-9

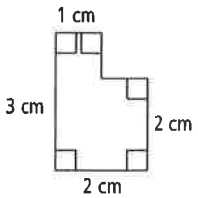
Find the perimeter and area of each figure.

43.



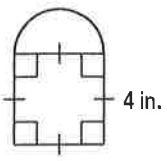
42 in., 98 in.^{2}

44.



10 cm, 5 cm^2

45.



(12 + 2π) in., (16 + 2π) in.^{2}

11. $(3,1)$

13. $(6, 1)$

15. $\left(3\frac{7}{8},-3\right)$

17. $(5,-1)$

19. $(12,-24)$

21. $(5.5,-13.5)$

23. 18

25. 9

27. 10

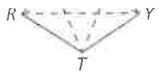
29. 12.2

31. 8.2

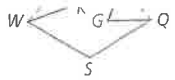
33. 8.5

Q Can a polygon be both concave and convex? Explain. **[No; when one diagonal has points outside the polygon, the polygon is concave.]**

Q Could the angle between any two sides of a polygon measure 180? Explain. **[No, that would be a straight angle, and both of those sides would be considered parts of a straight edge.]**



A **convex polygon** has no diagonal with points outside the polygon.



A **concave polygon** has at least one diagonal with points outside the polygon.

In this textbook, a polygon is convex unless otherwise stated.

Example 2

Classify the polygon by its number of sides. Tell whether the polygon is *convex* or *concave*.

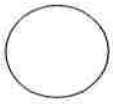
The polygon has six sides. Therefore, it is a hexagon.

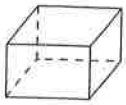
No diagonal of the hexagon contains points outside the hexagon. The hexagon is convex.

Exercises

Is the figure a polygon? If not, explain why.

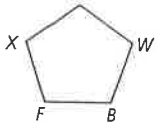
1. 

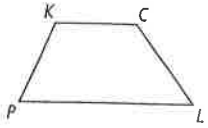
2. 

3. 

4. 

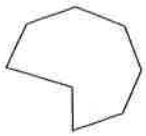
Name the polygon. Then identify its sides and angles.

5. 

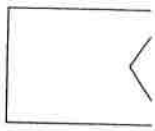
6. 

7. 

Classify the polygon by its number of sides. Tell whether the polygon is *convex* or *concave*.

8. 

9. 

10. 

Answers

Exercises

1. yes
2. no; no sides and vertices
3. no; not a plane figure
4. no; intersecting sides
5. Sample: *FBWMX*; sides are $\overline{FB}$, $\overline{BW}$, $\overline{WM}$, $\overline{MX}$, $\overline{XF}$; angles are $\angle F$, $\angle B$, $\angle W$, $\angle M$, $\angle X$
6. Sample: *CLPK*; sides are $\overline{CL}$, $\overline{LP}$, $\overline{PK}$, $\overline{KC}$; angles are $\angle C$, $\angle L$, $\angle P$, $\angle K$
7. Sample: *AGNHEPT*; sides are $\overline{AG}$, $\overline{GN}$, $\overline{NH}$, $\overline{HE}$, $\overline{EP}$, $\overline{PT}$, $\overline{TA}$; angles are $\angle A$, $\angle G$, $\angle N$, $\angle H$, $\angle E$, $\angle P$, $\angle T$
8. octagon, concave
9. nonagon or enneagon, convex
10. pentagon, concave

Name Key Period_____

Geometry: 1.7b Assignment

Find (a) the distance between the points to the nearest tenth.

(b) the coordinates of the midpoint of the segments with the given endpoints.

35. $A(2, 1), B(3, 0)$

a) 1.4

b) (2.5, .5)

36. $R(5, 2), S(-2, 4)$

a) 7.3

b) (1.5, 3)

37. $Q(-7, -4), T(6, 10)$

a) 19.1

b) (-.5, 3)

38. $C(-8, -1), D(-5, -11)$

a) 17.7

b) (-6.5, -6)

39. A map of a city and suburbs shows an airport located at $A(25, 11)$. An ambulance is on a straight expressway headed from the airport to Grant Hospital at $G(1, 1)$. The ambulance gets a flat tire at the midpoint M of $\overline{AG}$. As a result, the ambulance crew calls for helicopter assistance.

a. What are the coordinates of point M?

(13, 6)

b. How far does the helicopter have to fly to get from M to G? Assume all coordinates are in miles.

13 miles

7. 22 in.

9. 38 ft

11. 10π ft

13. $\frac{\pi}{2}$ m

15. $17+\sqrt{65}$ units

17. 38 units

19. $3\frac{1}{3}$ yd^2 or 4320 $in.^2$

21. 0.8 m^2 or 8000 cm^2

23. 400π m^2

25. 9.9225π ft^2

27. 153.9 ft^2

29. 452.2 cm^2

31. 310 m^2.

33. 208 ft^2.

page 1

1-1 Additional Problems
Net and Drawings for Visualizing Geometry

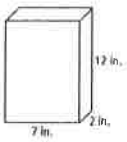
Problem 1

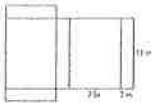
The net below folds into a cube. Which letters will be on the top and front of the cube?

B becomes the top, D becomes the front.

Problem 2

What is a net for the cereal box below? Label the net with its dimensions.





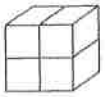
(Other solutions are possible.)

page 2

1-1 Additional Problems (continued)
Net and Drawings for Visualizing Geometry

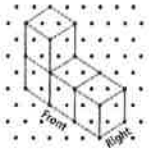
Problem 3

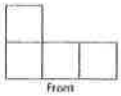
What is the isometric drawing of the cube structure below?



Problem 4

What is the front orthographic drawing for the isometric drawing below?





page 3

1-2 Additional Problems
Points, Lines, and Planes

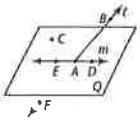
Problem 1

a. What are two other ways to name $\overleftrightarrow{AB}$?

b. What are two ways to name plane Q?

c. What are the names of three collinear points?

d. What are the names of four coplanar points?



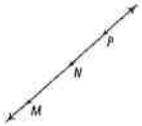
a. line ℓ and $\overleftrightarrow{BA}$
b. plane AEC, plane ADC
c. points E, A, and D
d. points C, E, A, and D

Problem 2

a. What are the names of the segments in the figure below?

b. What are the names of the rays in the figure?

c. Which of the rays in part (b) are opposite rays?



a. $\overline{MN}$, $\overline{NP}$, $\overline{MP}$ or $\overline{PN}$, $\overline{PM}$, $\overline{NM}$
b. $\overrightarrow{MP}$, $\overrightarrow{NP}$, $\overrightarrow{MN}$, $\overrightarrow{PN}$, $\overrightarrow{NM}$ and $\overrightarrow{PM}$
c. $\overrightarrow{NP}$ and $\overrightarrow{NM}$

page 4

1-2 Additional Problems (continued)
Points, Lines, and Planes

Problem 3

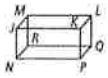
Each surface of the box represents part of a plane. What is the intersection of plane AEH and plane EGH? line EH

Problem 4

Use the figure below.

a. Which plane contains points J, M, and L?

b. Which plane contains points L, P, and Q?



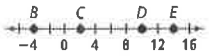
a. plane JML on the top of the figure
b. plane LPQ on the right of the figure

page 5

1-3 Additional Problems
Measuring Segments

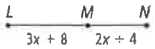
Problem 1

What is CD? 8



Problem 2

If $LN = 32$, what are LM and MN? $LM = 20$, $MN = 12$

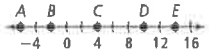


page 6

1-3 Additional Problems (continued)
Measuring Segments

Problem 3

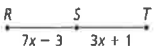
Are $\overline{AD}$ and $\overline{BE}$ congruent?



Yes, $AD = BE$.

Problem 4

S is the midpoint of $\overline{RT}$. What are RS, ST, and RT?



$RS = 4$, $ST = 4$, $RT = 8$

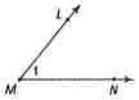
page 7

1-4 Additional Problems
Measuring Angles

Problem 1

What are two other names for $\angle 1$?

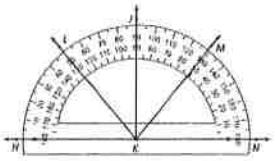
$\angle LMN$ and $\angle NML$



Problem 2

What are the measures of $\angle LKN$, $\angle NKM$, and $\angle JKN$? Classify each angle as acute, right, obtuse, or straight.

$m\angle LKN = 130$, obtuse;
$m\angle NKM = 50$, acute;
$m\angle JKN = 90$, right

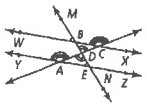


page 8

1-4 Additional Problems (continued)
Measuring Angles

Problem 3

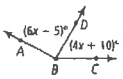
Use the diagram below. Which angle is congruent to $\angle WBM$?



$\angle AED$

Problem 4

If $m\angle ABC = 175$, what are $m\angle ABD$ and $m\angle CBD$?



$m\angle ABD = 97$ and $m\angle CBD = 78$

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1-5 Additional Problems
Exploring Angle Pairs

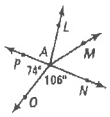
Problem 1

Use the diagram below. Is each statement true? Explain.

a. $\angle PAL$ and $\angle LAM$ are adjacent angles.

b. $\angle PAO$ and $\angle NAM$ are vertical angles.

c. $\angle PAO$ and $\angle NAO$ are supplementary.



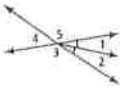
a. Yes, they have a common side, a common vertex, and share no interior points

b. No, they do not share two pairs of opposite rays

c. Yes, the sum of the angles is 180.

Problem 2

What can you conclude from the information in the diagram?



angles 1 and 2 are congruent; angles 3 and 5 are vertical angles; the angle pairs 1 and 2, 2 and 3, 3 and 4, 4 and 5, 5 and 1 are all pairs of adjacent angles; angles 4 and 5 and angles 3 and 4 are adjacent supplementary angles

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1-5 Additional Problems (continued)
Exploring Angle Pairs

Problem 3

$\angle ABC$ and $\angle DBC$ are a linear pair, $m\angle ABC = 3x + 19$, and $m\angle DBC = 7x - 9$. What are the measures of $\angle ABC$ and $\angle DBC$? **$m\angle ABC = 70$, $m\angle DBC = 110$**

Problem 4

$\overrightarrow{LM}$ bisects $\angle JLN$. If $m\angle JLM = 42$, what is $m\angle JLN$? **D**

A. 21

B. 42

C. 60

D. 84

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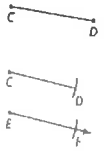
1-6 Additional Problems
Basic Constructions

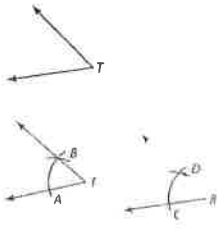
Problem 1

Construct $\overline{EF}$ so that $\overline{EF} \cong \overline{CD}$.



Problem 2

Construct $\angle R$ so that $\angle R \cong \angle T$.



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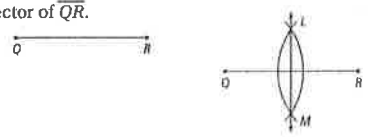
1-6 Additional Problems (continued)
Basic Constructions

Problem 3

Construct line LM so that LM is the perpendicular bisector of $\overline{QR}$.



Problem 4

Construct DE, the bisector of $\angle D$.

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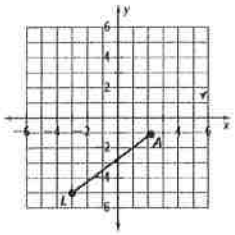
1-7 Additional Problems
Midpoint and Distance in the Coordinate Plane

Problem 1

$\overline{FG}$ has endpoints at -3 and 7. What is the coordinate of its midpoint? **2**

Problem 2

The midpoint of $\overline{LM}$ is $A(2, -1)$. One endpoint is $L(-3, -5)$. What are the coordinates of the other endpoint? **(7, 3)**



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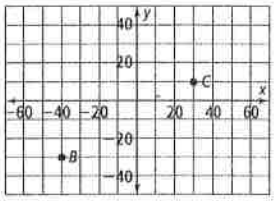
1-7 Additional Problems (continued)
Midpoint and Distance in the Coordinate Plane

Problem 3

What is the distance between (6, −2) and (−5, 3)? Round to the nearest tenth. **12.1 units**

Problem 4

On a zip-line course, you are harnessed to a cable that travels through the treetops. You start at Platform A and zip to each of the other platforms. How far do you travel from Platform B to Platform C? **80.6 meters**



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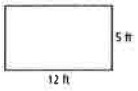
1-8 Additional Problems
Perimeter, Circumference, and Area

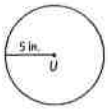
Problem 1

To place a fence on the outside of the garden, how much material will you need? **34 ft**



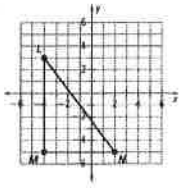
Problem 2

What is the circumference of the circle in terms of π? What is the circumference of each circle to the nearest tenth? **10π; 31.4 in.**



Problem 3

What is the perimeter of triangle LMN? **24 units**



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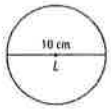
1-8 Additional Problems (continued)
Perimeter, Circumference, and Area

Problem 4

You are designing a rectangular flag for your city's museum. The flag will be 15 feet wide and 2 yards high. How many square yards of material do you need? **10 yd^2**

Problem 5

The diameter of $\odot L$ is 10 cm. What is its area in terms of π? **25π cm^2**



Problem 6

What is the area of the figure below? **256 m^2**