6.6 Exercises

Concept Check

Fill-in-the-Blank. Complete each sentence using information found in this section.

1. A closed plane figure with at least three sides in which each side is a line segment is a/an _____.
2. A four-sided polygon with both pairs of opposite sides parallel is a/an _____.
3. A polygon with four sides in which adjacent sides form right angles is a/an _____.
4. A figure that begins and ends at the same point is known as a/an _____ figure.
5. The line segment from the center of a circle to any point on the circle is a/an _____.
6. The perimeter of a circle is called the _____.

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

7. **a.** Every square is a rectangle.
   b. Every rectangle is a square.
8. **a.** Every parallelogram is a rectangle.
   b. Every rectangle is a parallelogram.
9. A trapezoid has only one pair of parallel lines.
10. The length of the diameter of a circle is half of the length of the radius.

Match each formula for perimeter to its corresponding geometric figure.

11.

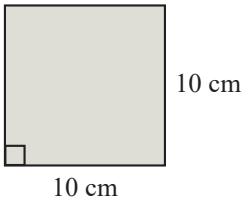
a.	square	**A.**	$P = 2l + 2w$
b.	parallelogram	**B.**	$C = 2\pi r$
c.	rectangle	**C.**	$P = 2b + 2a$
d.	trapezoid	**D.**	$P = a + b + c$
e.	triangle	**E.**	$P = a + b + c + d$
f.	circle	**F.**	$P = 4s$

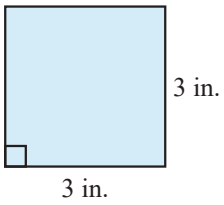
Practice

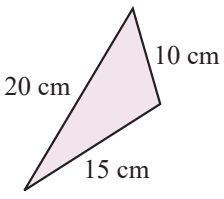
Calculate the perimeter of each figure described. Use $\pi \approx 3.14$.

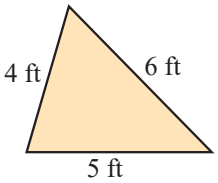
1. A parallelogram with sides of length 15 cm and 7 cm.
2. A parallelogram with sides of length 42 mm and 34 mm.
3. A rectangle with sides of length 24 cm and 34 cm.
4. A rectangle with sides of length $3\frac{1}{4}$ ft and $2\frac{5}{6}$ ft.
5. A square with sides of length $4\frac{1}{2}$ km.
6. A square with sides of length 11 m.
7. A triangle with sides of length 21 in., 67 in., and 55 in.
8. A triangle with sides of length 7.5 in., 17 in., and 13.6 in.
9. A trapezoid with sides of length 14.2 yd, 10.1 yd, 8 yd, and 15.8 yd.
10. A trapezoid with sides of length 31 ft, 39 ft, 45 ft, and 51 ft.
11. A circle with radius 0.5 m.
12. A circle with radius 1.5 ft.
13. A circle with diameter 60 cm.
14. A circle with diameter 14 m.

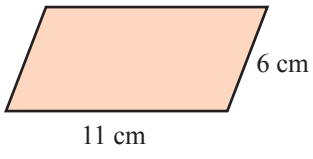
Calculate the perimeter of each figure. See Examples 1 through 6.

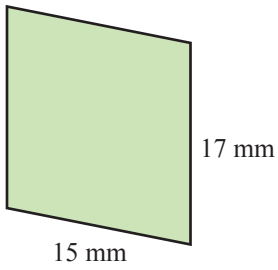
15. 

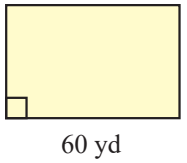
16. 

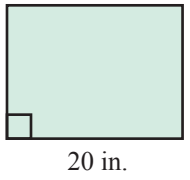
17. 

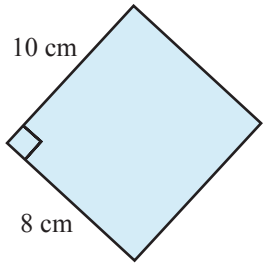
18. 

19. 

20. 

21. 

22. 

23. 

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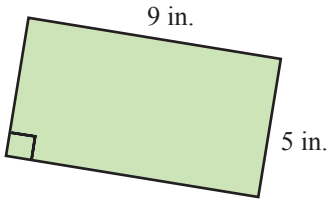

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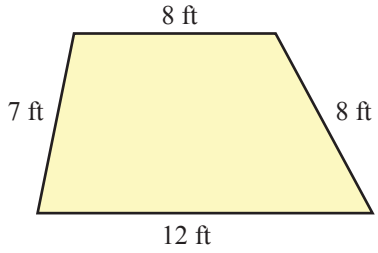

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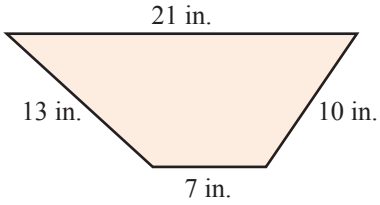

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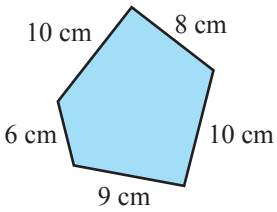

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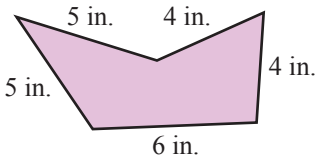

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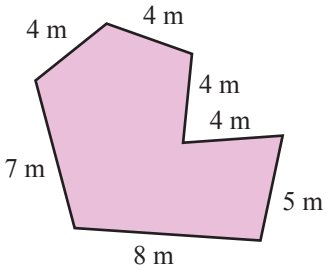

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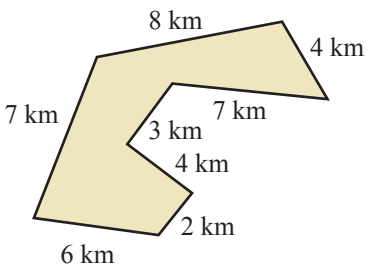

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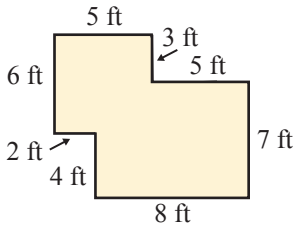

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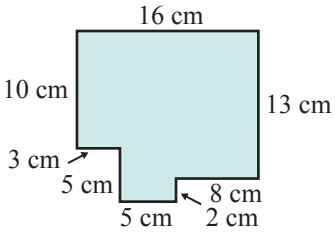

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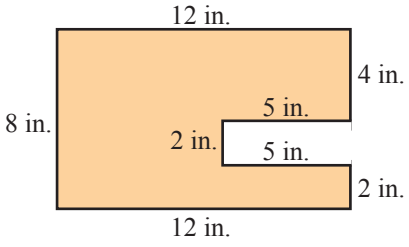

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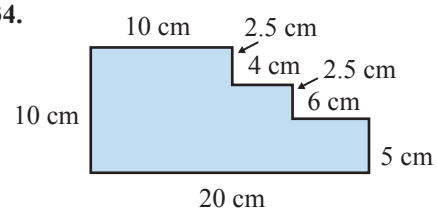

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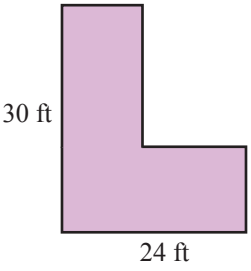

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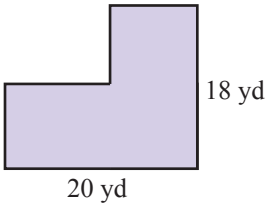
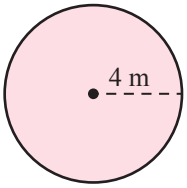


Calculate the perimeter of each figure. Use $\pi \approx 3.14$. See Examples 7 through 9.

37.



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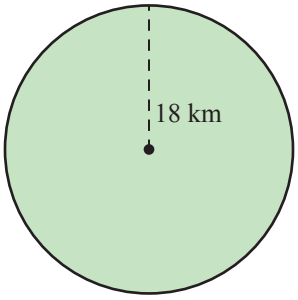

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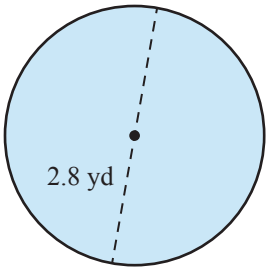

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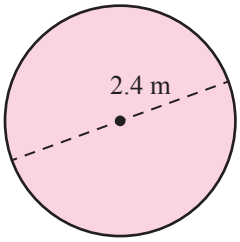

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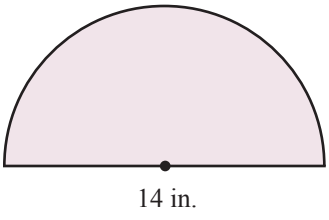

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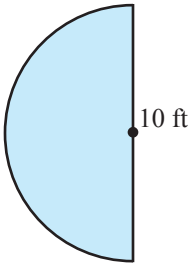

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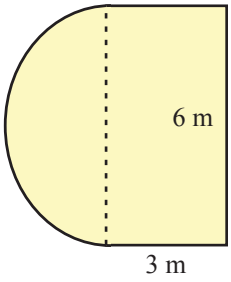

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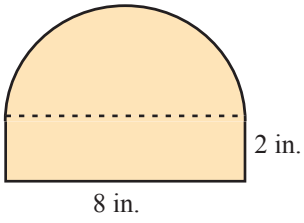

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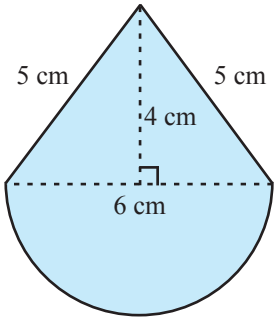

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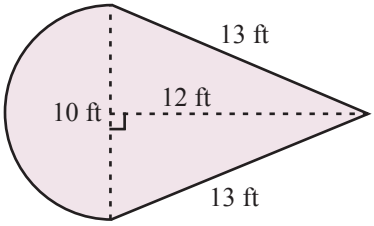

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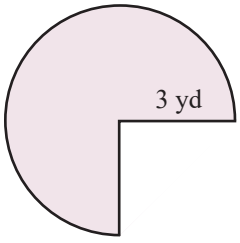

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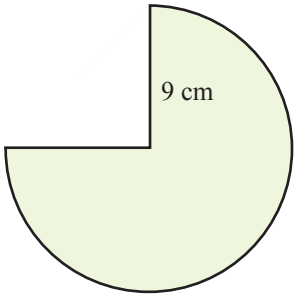
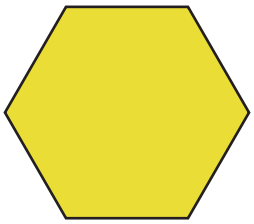


Applications

Solve.

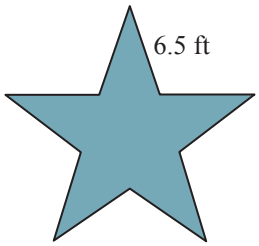
49. A regular hexagon is a six-sided figure with all six sides equal and all six angles equal. Find the perimeter of a regular hexagon with one side measuring 19 centimeters.



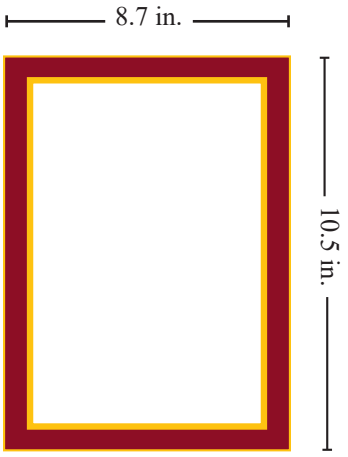
50. A five-pointed star-shaped flower plot, where each edge of the star is 6.5 feet, is placed in the middle of a lawn.

a. What is the perimeter of the plot?

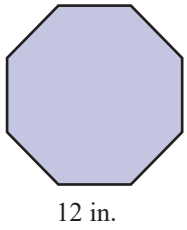
b. If edging material costs $2.40 per foot, how much will it cost to fully enclose the star?



51. A rectangular picture frame is 10.5 inches high and 8.7 inches wide. How much picture framing material must be used to frame the picture? (**Hint:** This is the same as the perimeter of the outer edge.)



52. A regular octagon is an eight-sided figure with all eight sides equal and all eight angles equal. Find the perimeter of a regular octagon if one side measures 12 inches. (**Note:** Where do you see regular octagons an a regular basis?)



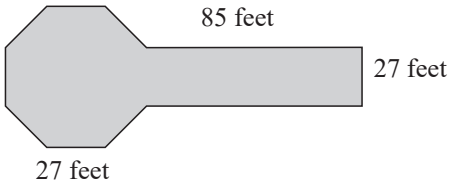
53. The Pentagon near Washington, D.C., is a five-sided building where each outside wall is 921 feet. [1]

a. What is the perimeter of the building?

b. If it takes a person 0.00341 minutes to walk 1 foot, how long will it take the person to walk completely around the building? Round your answer to the nearest tenth of a minute.

1 Source: www.infoplease.com/spot/pentagon1.html

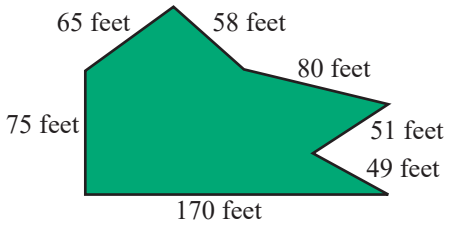
54. A public building consists of a rectangular portion used for office space that is 95 feet long and 27 feet wide connected to an octagonal shaped auditorium where each of the eight sides is the same length as the width of the rectangular portion. The roof is constructed so that there are rain gutters on all sides of the building. How much guttering must be purchased? (**Hint:** One side of the rectangle and one side of the octagon will not be included in computing the perimeter.)



55. A property owner has an odd-shaped lot as shown.

a. What is the perimeter of the lot?

b. If the cost of constructing a fence is $15.00 per foot, how much will it cost to construct a fence around the perimeter of the lot?

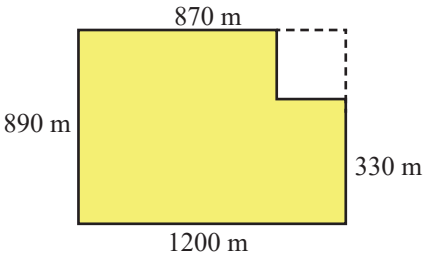


56. For exercise, John will walk along the path that is indicated by the solid line in the drawing. Note that he cuts a corner where both sides are the same length.

a. How many meters did John walk?

b. How long would the walk have been if John didn't cut the corner, but rather walked the full rectangle, as indicated by the dotted line?

c. How do these two distances compare?



57. An engineer who is designing a new smartphone decides to add a soft neoprene edging to the phone. The phone itself is $4\frac{1}{2}$ inches tall and $2\frac{2}{5}$ inches wide. How much neoprene edging is needed to go along the outside edge of each smartphone?

58. Jessica wants to add a decorative fringe to a throw rug. The rug is a rectangle with length 8 feet and width 5 feet. If Jessica wants to buy 1 foot more than the perimeter of the rug, how many feet of fringe must she buy?

Writing & Thinking

59. Name as many polygons as you can and include the number of sides for each one.

60. Give at least three examples where you might see specific polygons (outside of a class).

61. Explain, briefly, the meaning of perimeter. Write the formula for the perimeter of each of the five types of polygons discussed in this section.

62. The perimeter of a standard sheet of paper ($8\frac{1}{2}$ in. by 11 in.) is $P = 2 \cdot 8\frac{1}{2} + 2 \cdot 11 = 17 + 22 = 39$ inches. Use a pair of scissors to cut a rectangle from one corner of a standard sheet of paper and measure the perimeter of the new figure. Repeat this process several times (in some cases, cut more than one rectangle from a different corner and measure the perimeter each time). Give a brief explanation of the results in each case.