Find the sum of the interior angles of each polygon.

1. quadrilateral **2.** octagon **3.** 18-gon

Find the measure of an interior angle of each regular polygon.

4. decagon **5.** 12-gon **6.** 16-gon

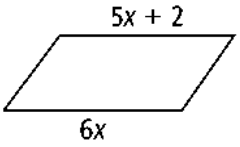
Find the measure of an exterior angle for each regular polygon.

7. octagon **8.** 24-gon **9.** decagon

Find the value of *x* in each parallelogram.

10.

11.



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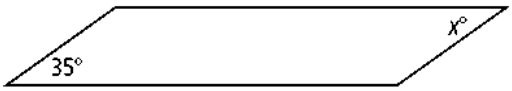

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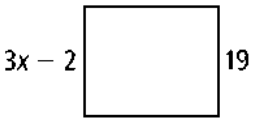

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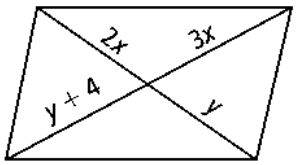

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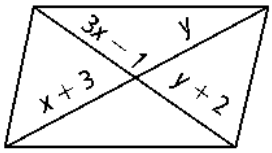

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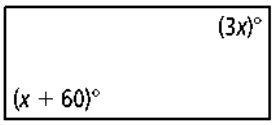

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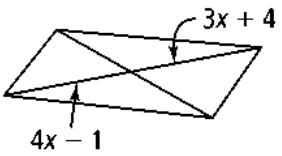
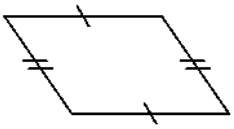


Can you prove that the quadrilateral is a parallelogram based on the given information? Explain.

18.



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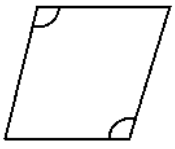

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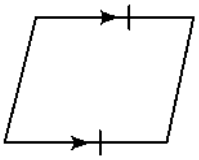

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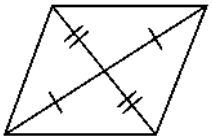

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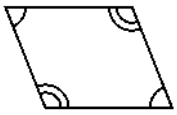

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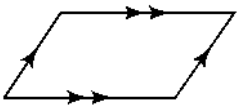
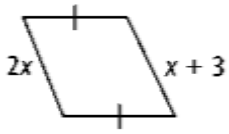


For what value of x must the quadrilateral be a parallelogram?

1.

2.



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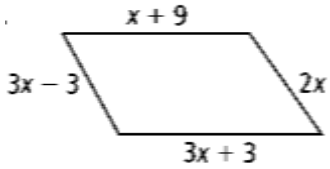

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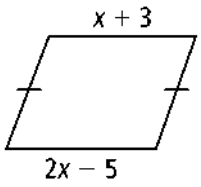

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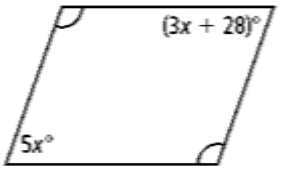

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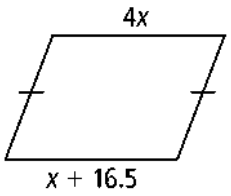
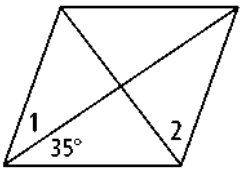


Determine the measure of the numbered angles in each rhombus.

7.



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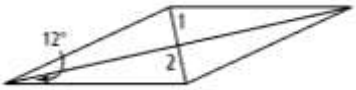
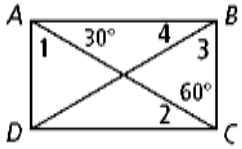
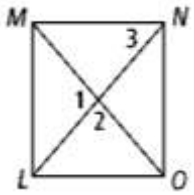


Determine the measure of the numbered angles in each figure.

9. rectangle *ABCD*



10. square *LMNO*



Algebra *TUVW* is a rectangle. Find the value of x and the length of each diagonal.

11. $TV = 3x$ and $UW = 5x - 10$

12. $TV = 2x - 4$ and $UW = x + 10$

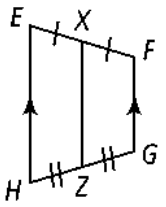
13. $TV = 6x + 4$ and $UW = 4x + 8$

14. $TV = 7x + 6$ and $UW = 9x - 18$

15. $TV = 8x - 2$ and $UW = 5x + 7$

16. $TV = 10x - 4$ and $UW = 3x + 24$

17. $\overline{XZ}$ is the midsegment of trapezoid *EFGH*. If $FG = 8$ and $EH = 12$, what is XZ?



Algebra Solve each proportion.

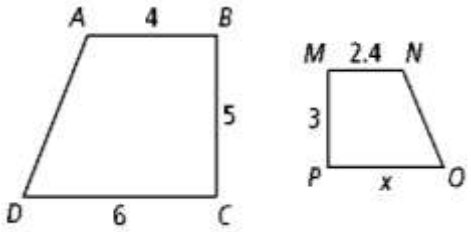
1. $\frac{300}{1600} = \frac{x}{4800}$ **2.** $\frac{40}{140} = \frac{700}{x}$ **3.** $\frac{x}{2000} = \frac{17}{400}$

4. The ratio of width to length of a rectangle is 7 : 10. The width of the rectangle is 91 cm. Write and solve a proportion to find the length.

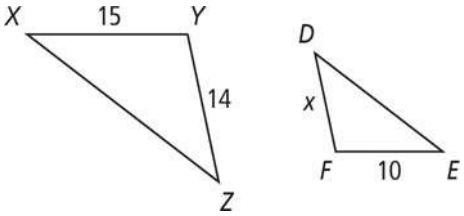
5. The ratio of the two acute angles in a right triangle is 5 : 13. What is the measure of each angle in the right triangle?

Give the scale factor of the polygons. Find the value of *x*. Round answers to the nearest tenth when necessary.

6. *ABCD* ~ *NMPO*

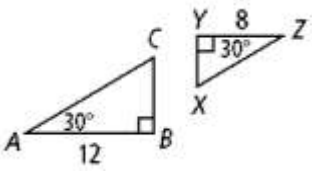


7. Δ *XYZ*~ Δ*EFD*



Determine whether the triangles are similar. If so, write a similarity statement and name the postulate or theorem you used. If not, explain.

8.



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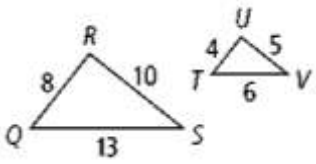

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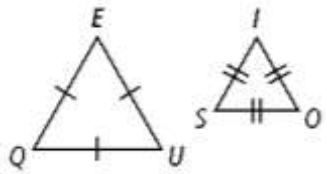


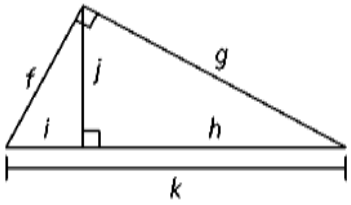
Algebra Find the geometric mean of each pair of numbers.

11. 2 and 8 **12.** 4 and 6 **13.** 8 and 10 **14.** 25 and 4

Use the figure to complete each proportion.

15.

$\frac{i}{\square} = \frac{f}{k}$ $\frac{i}{j} = \frac{j}{\square}$ $\frac{\square}{f} = \frac{f}{\square}$

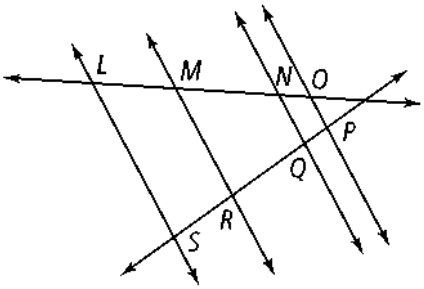


Exercises

Use the figure at the right to complete each proportion.

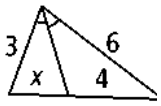
$\frac{\square}{MN} = \frac{SR}{LM}$ $\quad \frac{NO}{\square} = \frac{LM}{SR}$

$\frac{MN}{RQ} = \frac{\square}{QP}$ $\quad \frac{SQ}{LN} = \frac{RP}{\square}$



Algebra Solve for x.

5.



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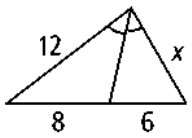

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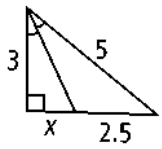

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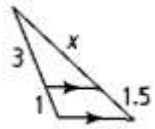

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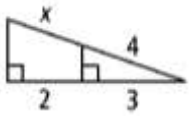

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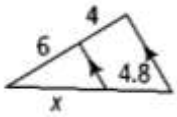

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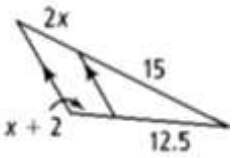

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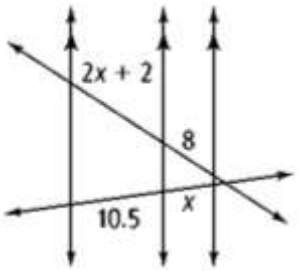

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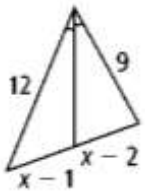


The lengths of the sides of a triangle are given. Classify each triangle as *acute, right,* or *obtuse.*

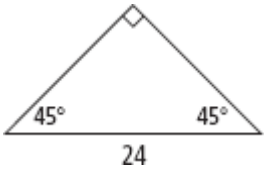
14. 7, 9, 10

15. 18, 16, 24

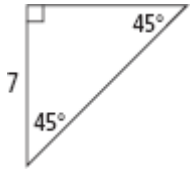
16. 3, 5, $5\sqrt{2}$

Use the diagrams below each exercise to complete Exercises 17–19.

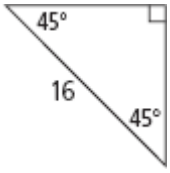
17. Find the length of the leg of the triangle.



18. Find the length of the hypotenuse of the triangle

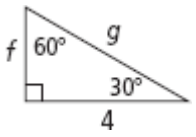


19. Find the length of the leg of the triangle.



For Exercises 1–3, find the value of each variable.

1.



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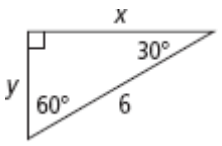

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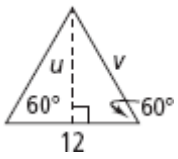
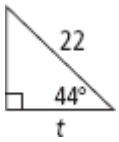


Exercises

Find the value of *t* to the nearest tenth.

4.



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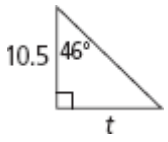
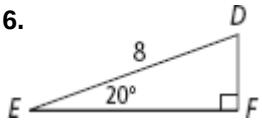


Find the missing lengths in each right triangle. Round your answers to the nearest tenth

6.



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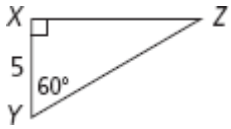
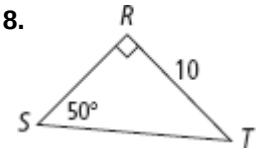


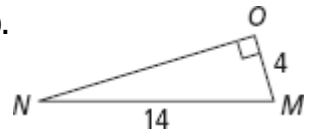
8.



Exercises

Find *m*∠*M* to the nearest degree.

9.



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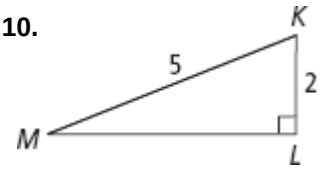

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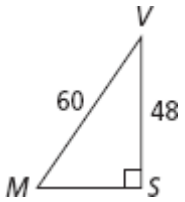

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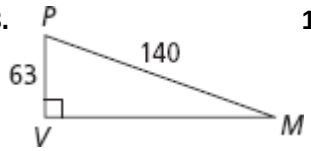

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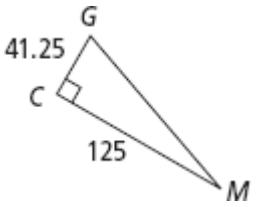
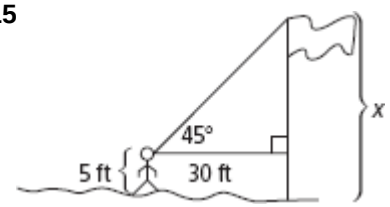


Exercises

Find the value of *x*. Round the lengths to the nearest tenth of a unit.

15



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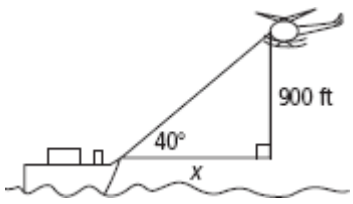

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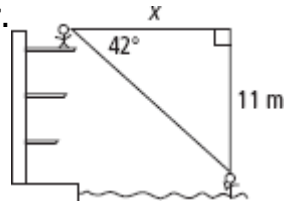

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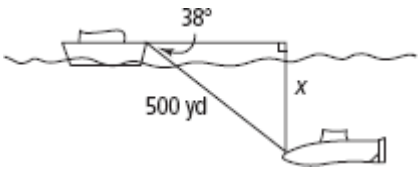


Exercises

Use the information given to solve.

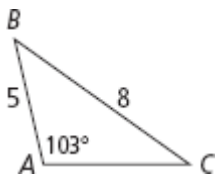
1. In ΔABC, $m\angle A = 45$, $m\angle C = 70$, and $BC = 6$. To the nearest tenth, what is AB?
2. In ΔPQR, $m\angle P = 30$, $m\angle Q = 80$, and $PR = 15$. To the nearest tenth, what is QR?
3. In ΔXYZ, $m\angle X = 110$, $m\angle Y = 15$, and $YZ = 18$. To the nearest tenth, what is XZ?

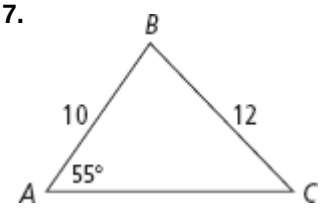
Exercises

Use the information given to solve.

4. In ΔXYZ, $m\angle Y = 106$, $XY = 10$, and $XZ = 18$. To the nearest tenth, what is $m\angle Z$?
5. In ΔABC, $m\angle B = 95$, $AC = 12$, and $BC = 8$. To the nearest tenth, what is $m\angle A$?

Use the Law of Sines to find $m\angle C$. Round to the nearest tenth.

6. 

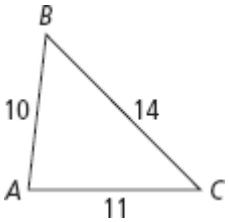
7. 

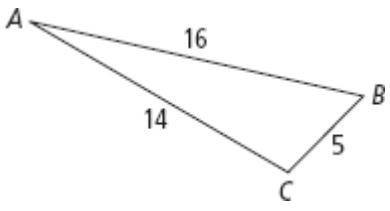
8. In ΔMNP, $MN = 10$, $MP = 15$, and $m\angle M = 40$. To the nearest tenth, what is NP?
9. In ΔPQR, $PQ = 24$, $QR = 28$, and $m\angle Q = 100$. To the nearest tenth, what is PR?
10. In ΔABC, $AC = 11$, $BC = 24$, and $m\angle C = 75$. To the nearest tenth, what is AB?

Use the information given to solve.

11. In ΔPQR, $PQ = 20$, $QR = 18$, and $PR = 24$. To the nearest tenth, what is $m\angle Q$?
12. In ΔABC, $AB = 6$, $BC = 12$, and $AC = 8$. To the nearest tenth, what is $m\angle A$?

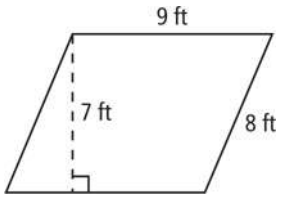
Use the Law of Cosines to find $m\angle C$. Round to the nearest tenth.

13. 

14 

Find the area of each parallelogram.

1.



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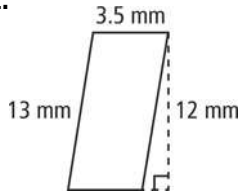

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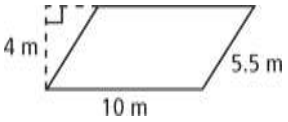
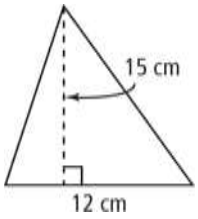


Find the area of each triangle.

4.



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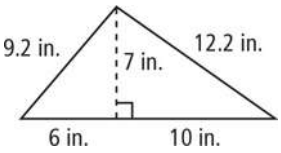

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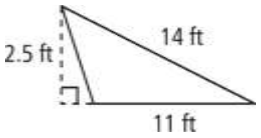
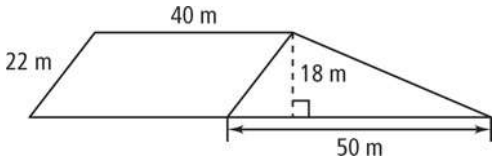
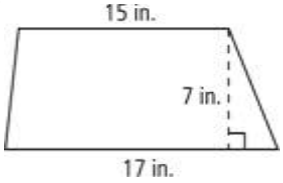


7. The figure at the right consists of a parallelogram and a triangle. What is the area of the figure?



Find the area of each trapezoid. If necessary, leave your answer in simplest radical form.

8.



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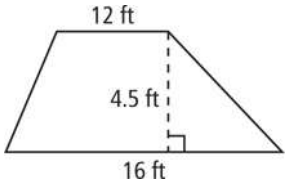

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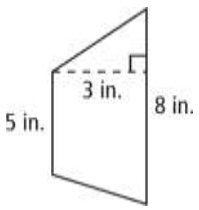

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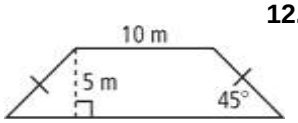

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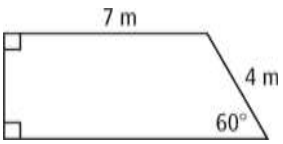

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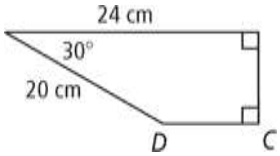
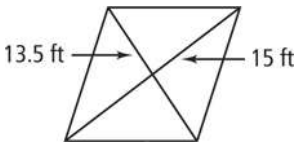


Find the area of each rhombus. Leave your answer in simplest radical form.

14.



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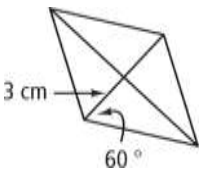

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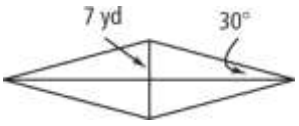
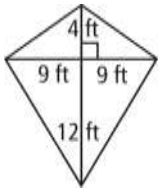


Find the area of each kite. Leave your answer in simplest radical form.

1.



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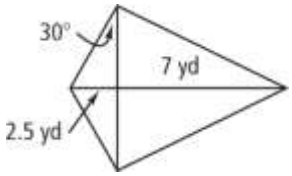

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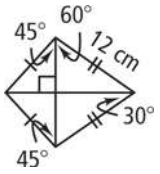
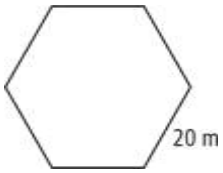


Find the area of each regular polygon. Leave answers in simplest radical form.

4.



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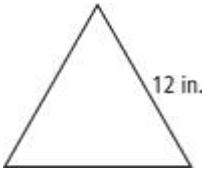
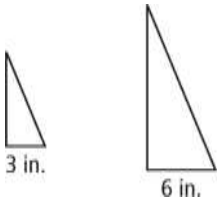


6.

The figures in each pair are similar. Compare the first figure to the second. Give the ratio of the perimeters and the ratio of the areas.

7.



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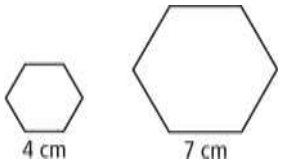

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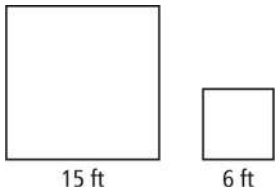
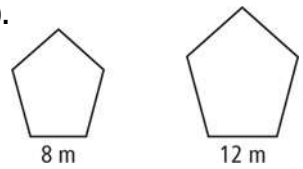


The figures in each pair are similar. The area of one figure is given. Find the area of the other figure to the nearest whole number.

10.

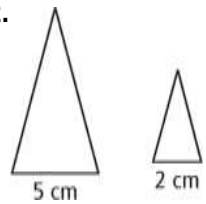


Area of smaller pentagon = 112 m^2

11.

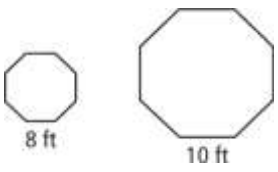
Area of smaller rectangle = 78 $in.^2$

12.



Area of larger triangle = 75 cm^2

13.



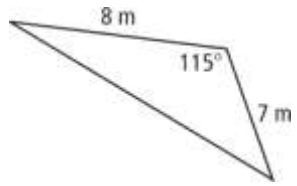
Area of smaller octagon = 288 ft

Find the area of each regular polygon. Round your answers to the nearest tenth.

1. octagon with side 2 in. **2.** decagon with side 4 cm

Find the area of each triangle. Round your answers to the nearest tenth.

3.



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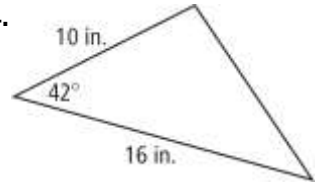
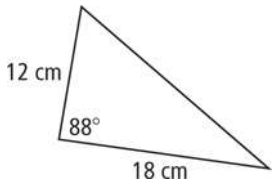


5.



Find each indicated measure for $\odot D$.

6. $m\angle EDI$

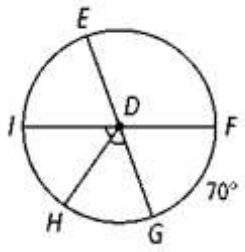
7. $m\overset{\frown}{EF}$

8. $m\overset{\frown}{GI}$

9. $m\angle IDH$

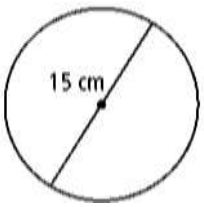
10. $m\overset{\frown}{FHE}$

11. $m\overset{\frown}{GIF}$



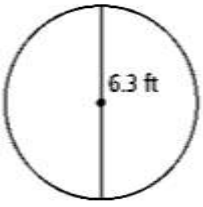
Find the circumference of each circle. Leave your answer in terms of π.

12.



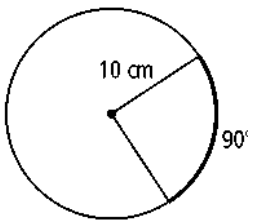
13.

14.



Find the length of each darkened arc. Leave your answer in terms of π.

15.



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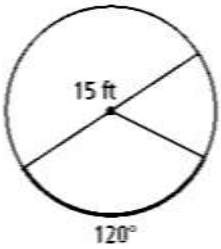
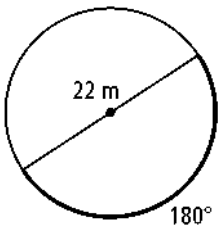
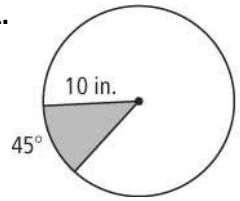


17.



Find the area of each shaded sector of a circle. Leave your answer in terms of π.

1.



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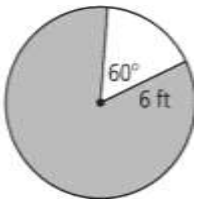

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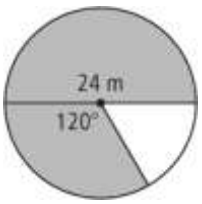
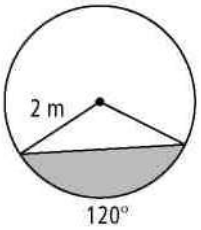


Find the area of each shaded segment. Round your answer to the nearest tenth.

4.



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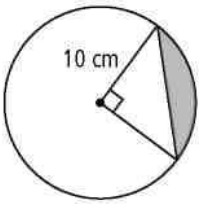

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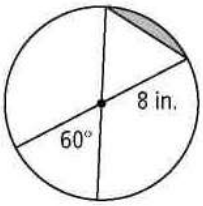

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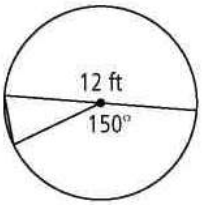
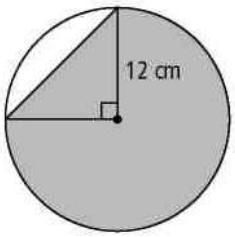


Find the area of the shaded region. Leave your answer in terms of π and in simplest radical form.

8.



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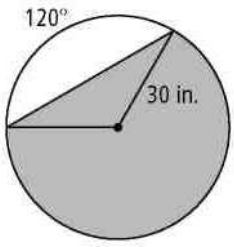
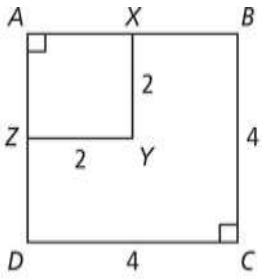


For Exercises 10–11 give your answer as a ratio and as a percent.

For Exercises 10 and 11 use square *ABCD* at the right.



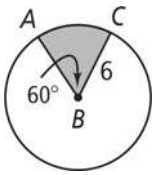
10. Point *P* in square *ABCD* is chosen at random.

Find the probability that *P* is in square *AXYZ.*

11. Find the probability that *P* is *not* in square *AXYZ.*

Point *P* in $\odot S$ is chosen at random. Find the probability that *P* is in sector *ABC*. Give your answer in terms of a ratio, then as a percent.

1.



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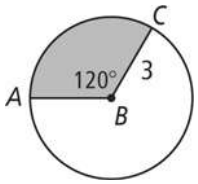

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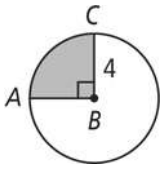
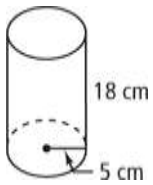


4. The cycle of the light on George Street at the intersection of George Street and Main Street is 10 seconds green, 5 seconds yellow, and 60 seconds red. If you reach the intersection at a random time, what is the probability that the light is red?

Find the surface area of each figure. Round your answers to the nearest tenth, if necessary.

5.



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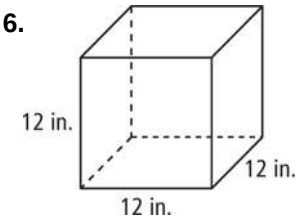

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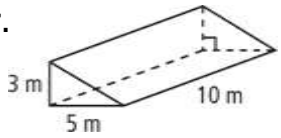


In Exercises 8–11, round your answers to the nearest tenth, if necessary.

8. Find the surface area of a cone with radius 5 m and slant height 15 m.

9. Find the surface area of a cone with radius 6 ft and height 11 ft.

10. Find the surface area of a cone with radius 16 cm and slant height 20 cm.

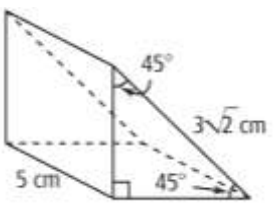
11. Find the surface area of a cone with radius 10 in. and height 15 in.

12. Find the surface area of a square pyramid with base length 16 cm and slant height 20 cm.

13. Find the surface area of a square pyramid with base length 10 in. and height 15 in.

Find the volume of each prism. Round to the nearest tenth.

14.



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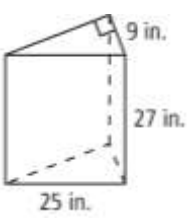

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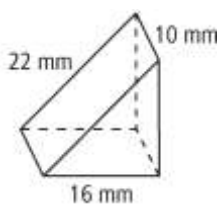

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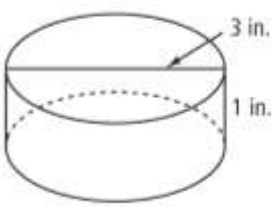

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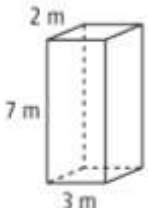

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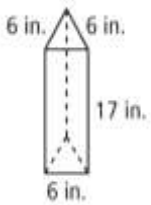
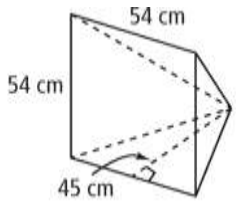


Find the volume of each pyramid. Round to the nearest whole number.

1.



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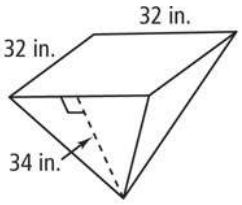

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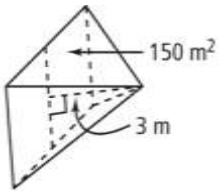
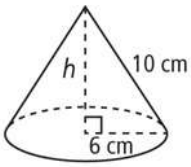


Find the volume of each figure. Round your answers to the nearest tenth.

4.



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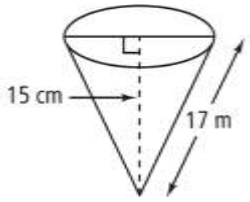

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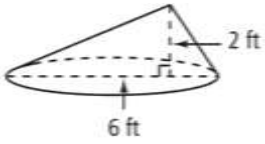

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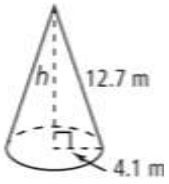
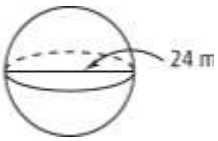


Find the volume and surface area of a sphere with the given radius or diameter. Round your answers to the nearest tenth.

7.



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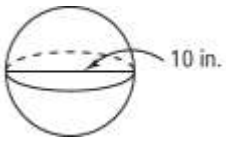

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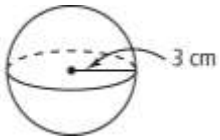
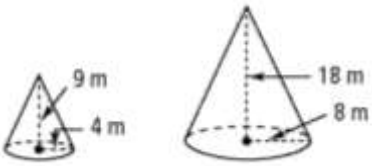


Are the two figures similar? If so, give the scale factor.

10.



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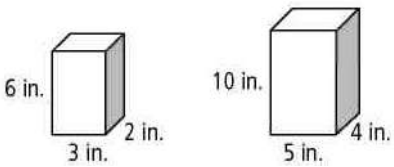


The surface areas of two similar figures are given. The volume of the larger figure is given. Find the volume of the smaller figure.

12. S.A. = 16 cm^2
S.A. = 100 cm^2
V = 500 cm^3

13. S.A. = 6 ft^2
S.A. = 294 ft^2
V = 3430 ft^3

14. S.A. = 45 m^2
S.A. = 80 m^2
V = 320 m^3

The volumes of two similar figures are given. The surface area of the smaller figure is given. Find the surface area of the larger figure.

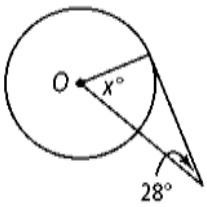
15. V = 12 $in.^3$
V = 96 $in.^3$
S.A. = 12 $in.^2$

16. V = 6 cm^3
V = 384 cm^3
S.A. = 6 cm^2

17. V = 40 ft^3
V = 135 ft^3
S.A. = 20 ft^2

In each circle, what is the value of *x*?

1.



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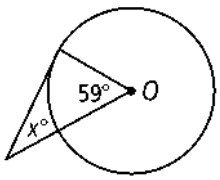

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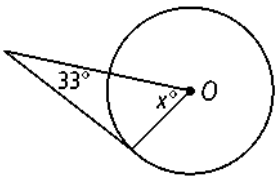
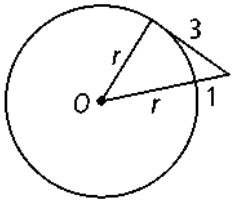


In each circle, what is the value of *r*?

4.



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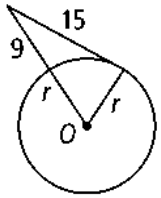

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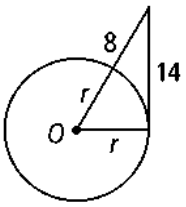
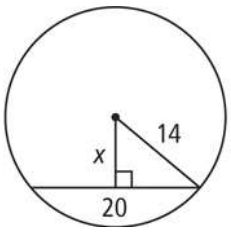


Find the value of *x* to the nearest tenth.

7.



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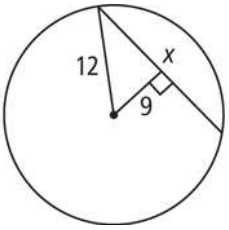

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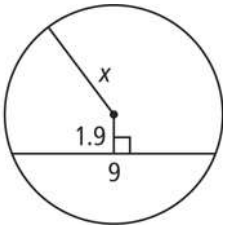
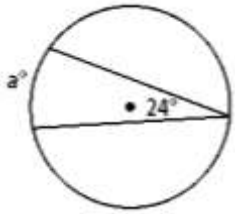


In Exercises 10–18, find the value of each variable.

10



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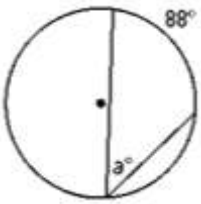

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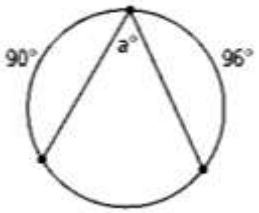

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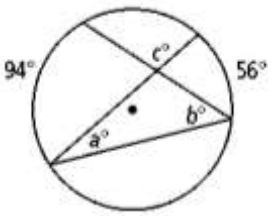

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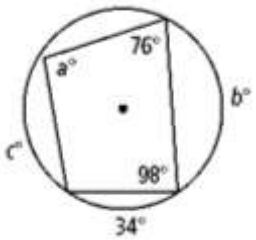
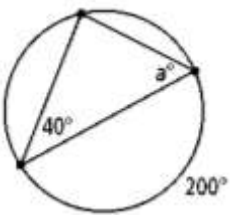


15.



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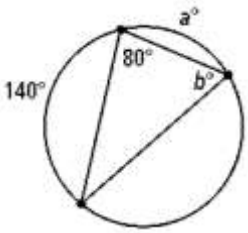

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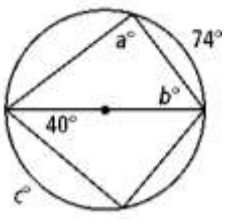

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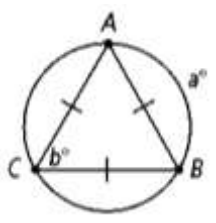
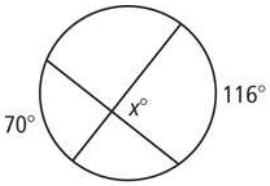


Algebra Find the value of each variable.

1.



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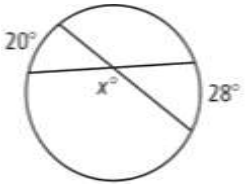

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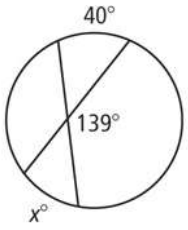

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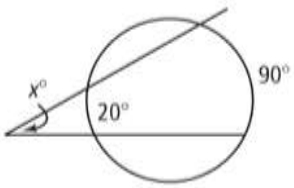

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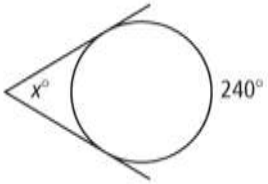

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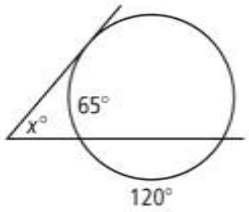

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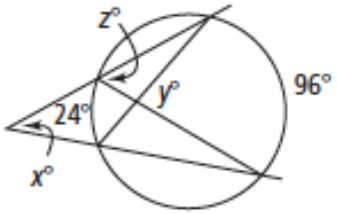

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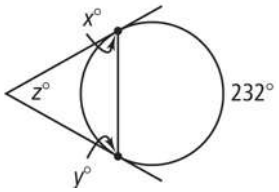

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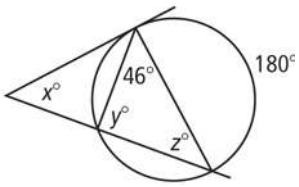
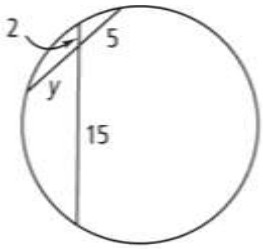


Algebra Find the value of each missing variable.

10.



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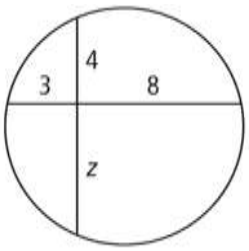

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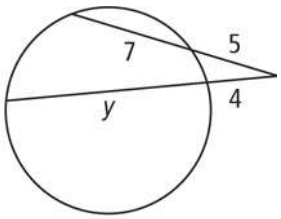

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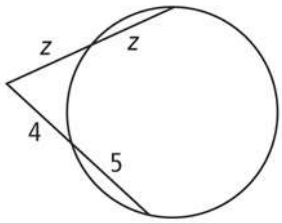

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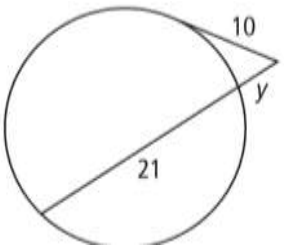

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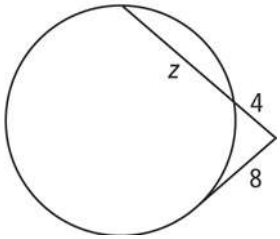

Write the standard equation of the circle with the given center that passes through the given point. Check the point using your equation.

16. center (2, −4); point (6, −4)

17. center (0, 2); point (3, −2)

18. center (−1, 3); point (7, −3)

19. center (1, 0); point (0, 5)

Describe each of the following, and then compare your answers with those of a partner.

1. the locus of points equidistant from your desk and your partner's desk

2. the locus of points on the floor equidistant from the two side walls of your classroom

3. the locus of points equidistant from a window and the door of your classroom

4. the locus of points equidistant from the front and back walls of your classroom

5. the locus of points equidistant from the floor and the ceiling of your classroom

6.