11.5 Areas of Circles and Sectors

THEOREM *For Your Notebook*

THEOREM 11.9 Area of a Circle

The area of a circle is π times the square of the radius.

$A = \pi r^2$

Justification: Ex. 43, p. 761; Ex. 3, p. 769

EXAMPLE 1 Use the formula for area of a circle

Find the indicated measure.

a. Area

$r = 2.5$ cm

b. Diameter

$A = 113.1$ cm^2

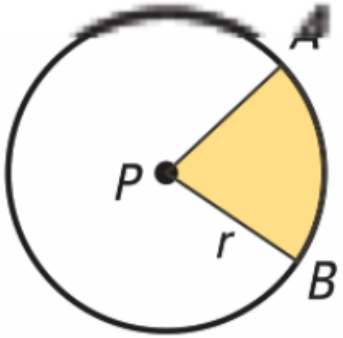
SECTORS A **sector of a circle** is the region bounded by two radii of the circle and their intercepted arc. In the diagram below, sector APB is bounded by $\overline{AP}$, $\overline{BP}$, and $\overset{\frown}{AB}$. Theorem 11.10 gives a method for finding the area of a sector.

THEOREM

For Your Notebook

THEOREM 11.10 Area of a Sector

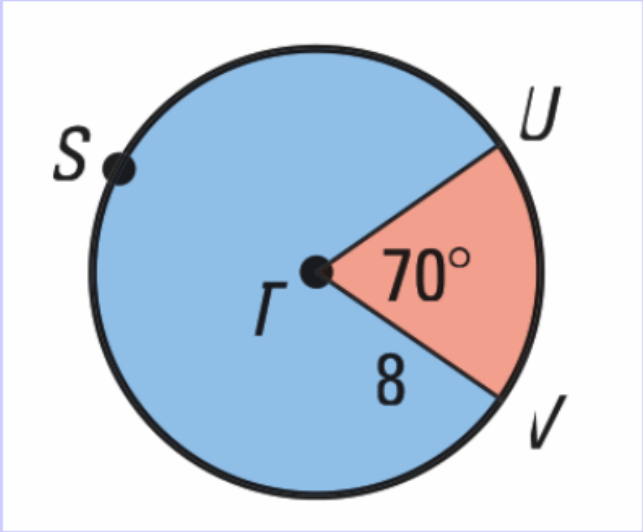
The ratio of the area of a sector of a circle to the area of the whole circle (πr^2) is equal to the ratio of the measure of the intercepted arc to 360°.



$$\frac{\text{Area of sector } APB}{\pi r^2} = \frac{m\overset{\frown}{AB}}{360^\circ}, \text{ or Area of sector } APB = \frac{m\overset{\frown}{AB}}{360^\circ} \cdot \pi r^2$$

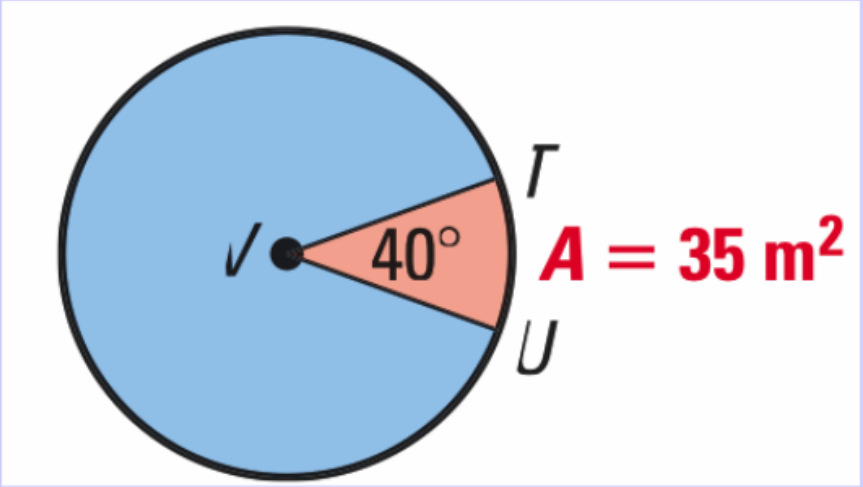
EXAMPLE 2 Find areas of sectors

Find the areas of the sectors formed by $\angle UTV$.



EXAMPLE 3 Use the Area of a Sector Theorem

Use the diagram to find the area of $\odot V$.

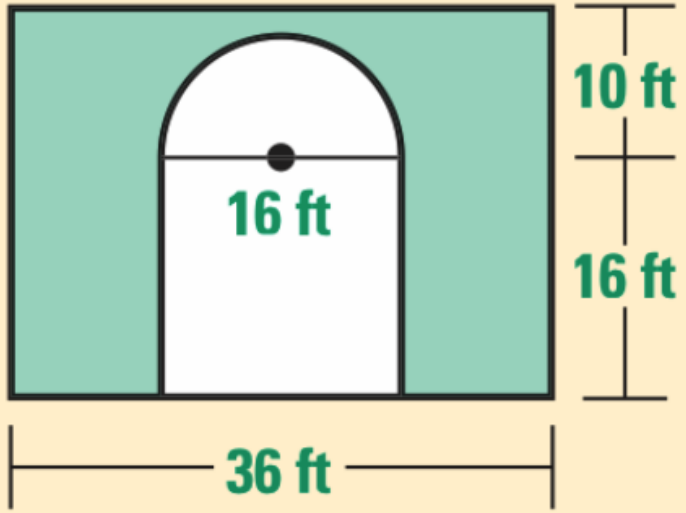


EXAMPLE 4 Standardized Test Practice

A rectangular wall has an entrance cut into it. You want to paint the wall. To the nearest square foot, what is the area of the region you need to paint?

(A) 357 ft^2 (B) 479 ft^2

(C) 579 ft^2 (D) 936 ft^2



Assignment:

11.5 ws

LESSON 11.5

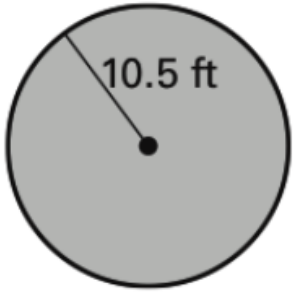
Practice B

For use with pages 755–761

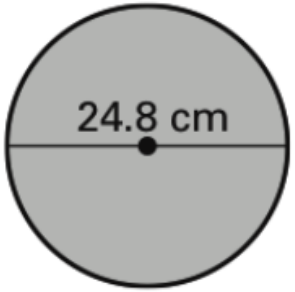
Find the exact area of the circle. Then find the area to the nearest hundredth.

1.

2.



3.



Find the indicated measure.

4. The area of a circle is 173 square inches. Find the radius.

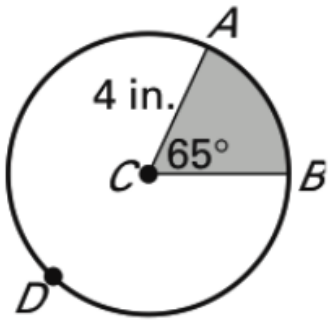
5. The area of a circle is 290 square meters. Find the radius.

6. The area of a circle is 654 square centimeters. Find the diameter.

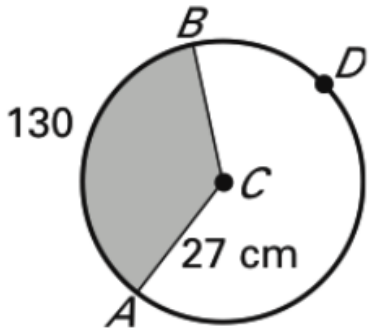
7. The area of a circle is 528 square feet. Find the diameter.

Find the areas of the sectors formed by $\angle ACB$.

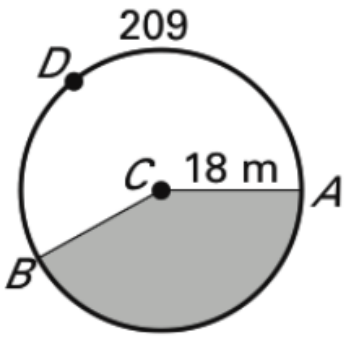
8.



9.

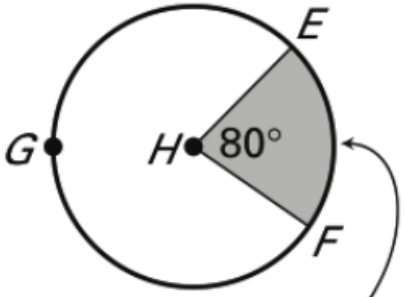


10.



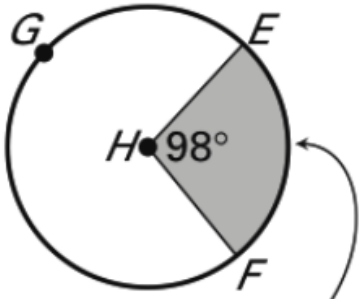
se the diagram to find the indicated measure.

1. Find the area of $\odot H$.



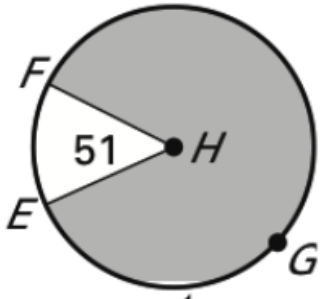
$A = 23.79 \text{ ft}^2$

12. Find the radius of $\odot H$.



$A = 40.62 \text{ in.}^2$

13. Find the diameter of $\odot H$.

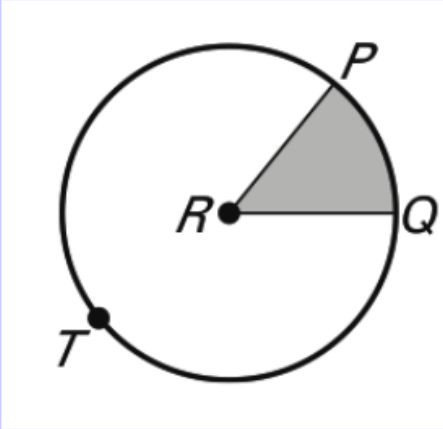


$A = 31.47 \text{ m}^2$

The area of $\odot R$ is 295.52 square inches. The area of sector PRQ is 55 square inches. Find the indicated measure.

14. Radius of $\odot R$

15. Circumference of $\odot R$



16. $m\overset{\frown}{PQ}$

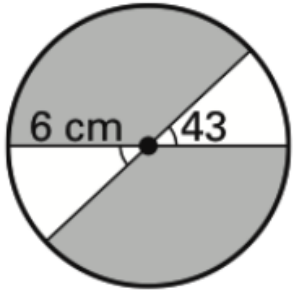
17. Length of $\overset{\frown}{PQ}$

18. Perimeter of shaded region

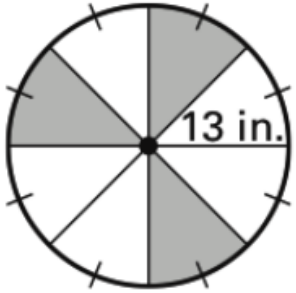
19. Perimeter of unshaded region

Find the area of the shaded region.

20.



21.



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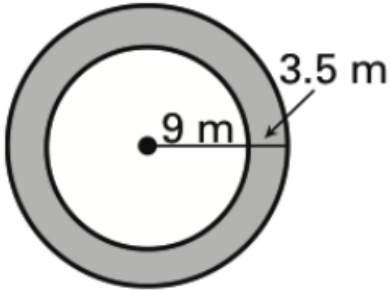

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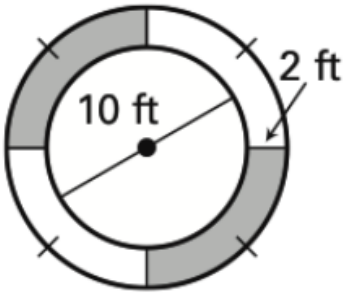

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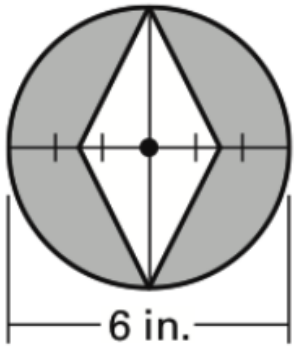

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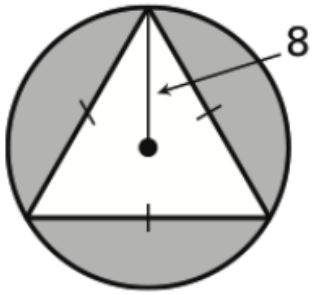
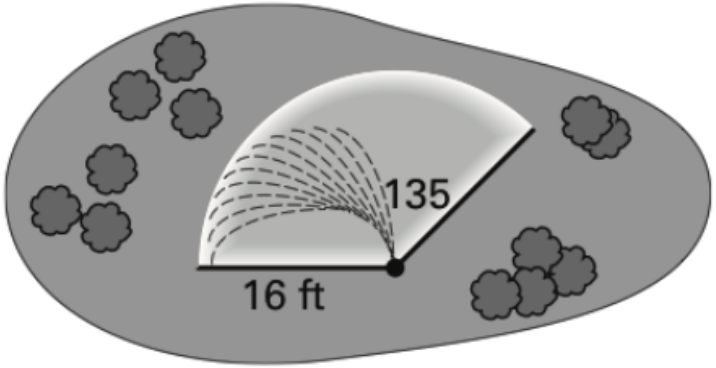


26. Fountain A circular water fountain has a diameter of 42 feet. Find the area of the fountain.

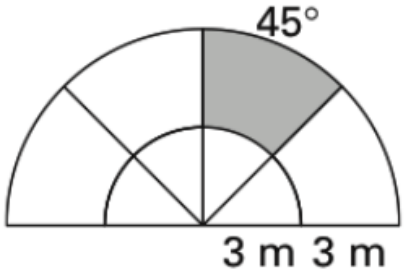
27. Landscaping The diagram at the right shows the area of a lawn covered by a water sprinkler.



a. What is the area of the lawn that is covered by the sprinkler?

b. The water pressure is weakened so that the radius is 10 feet. What is the area of lawn that will be covered?

28. Window Design The window shown is in the shape of a semicircle. Find the area of the glass in the shaded region.



Assignment:

p. 758 (3-9, 11-18, 20-31 all)