10.2 Start Thinking

As the minute hand on a clock makes one complete revolution, we say that it has rotated 360°. What amount of time corresponds to this 360° rotation? Use this information to determine the angle the minute hand on a clock creates for the following amounts of time.

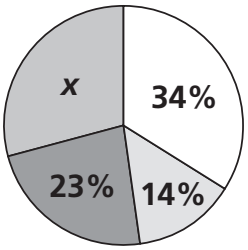
1. 30 minutes **2.** 45 minutes **3.** 10 minutes

4. 9 minutes **5.** 48 minutes **6.** 52 minutes

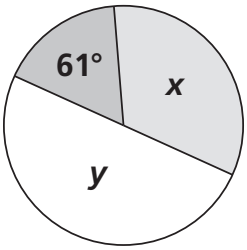
10.2 Warm Up

Determine the value of *x* for the circle graph. Pay close attention to the units.

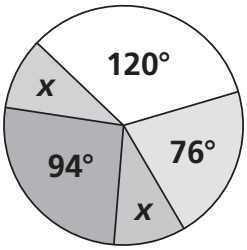
1.



2.



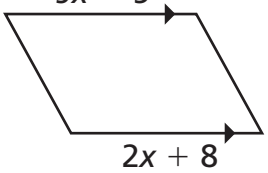
3.



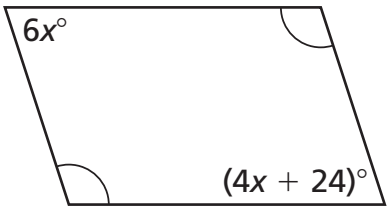
10.2 Cumulative Review Warm Up

Find the value of *x* that makes the quadrilateral a parallelogram.

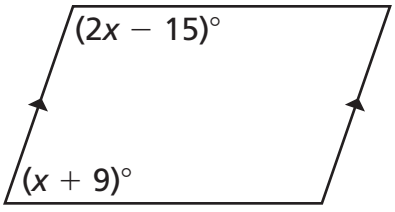
1.



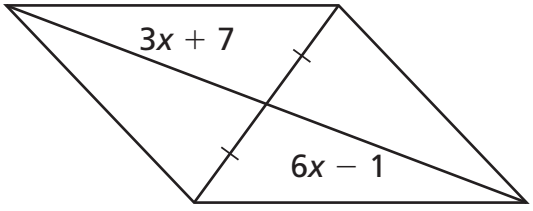
2.



3.



4.

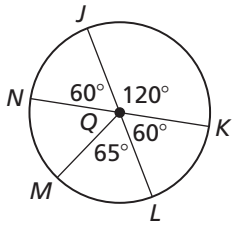


Name _____ Date _____

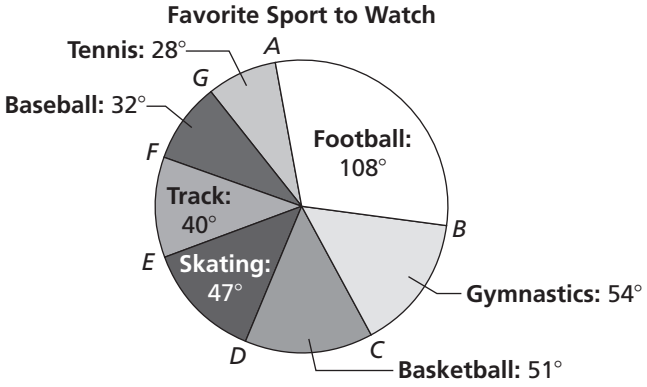
10.2 Practice A

In Exercises 1–4, identify the given arc as a *major arc*, *minor arc*, or *semicircle*. Then find the measure of the arc.

1. $\overset{\frown}{NM}$
2. $\overset{\frown}{JLM}$
3. $\overset{\frown}{NLK}$
4. $\overset{\frown}{LMN}$



5. A recent survey asked high school girls to name the sport they like to watch the most. The results are shown in the circle graph. Find each indicated measure.



   a. $m\overset{\frown}{FG}$

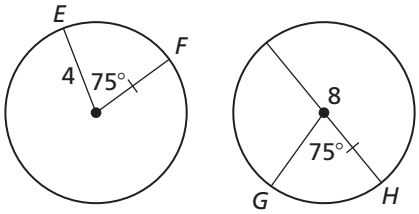
   b. $m\overset{\frown}{EGB}$

   c. $m\overset{\frown}{DB}$

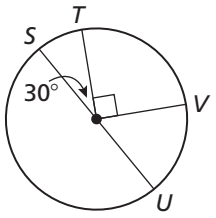
   d. $m\overset{\frown}{ACE}$

In Exercises 6 and 7, tell whether the given arcs are congruent. Explain why or why not.

6. $\overset{\frown}{EF}$ and $\overset{\frown}{GH}$

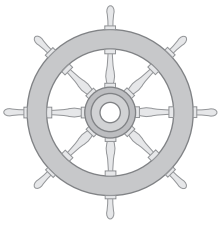


7. $\overset{\frown}{STV}$ and $\overset{\frown}{UVT}$

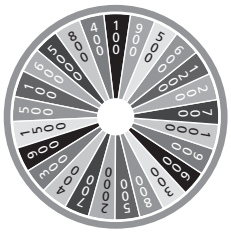


8. Each wheel shown is divided into congruent sections. Find the measure of each arc.

   a.



   b.

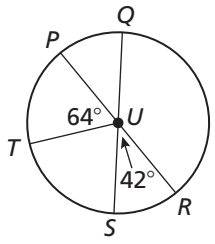


Name_____ Date _____

10.2 Practice B

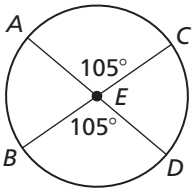
In Exercises 1–4, identify the given arc as a *major arc*, *minor arc*, or *semicircle*. Then find the measure of the arc of $\odot U$ if $\overline{SQ}$ and $\overline{PR}$ are diameters.

1. $\overset{\frown}{QRS}$
2. $\overset{\frown}{TS}$
3. $\overset{\frown}{TPS}$
4. $\overset{\frown}{PQ}$

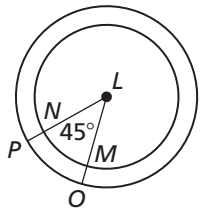


In Exercises 5–7, tell whether the given arcs are congruent. Explain why or why not.

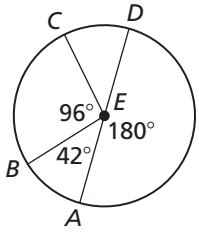
5. $\overset{\frown}{AC}$ and $\overset{\frown}{BD}$



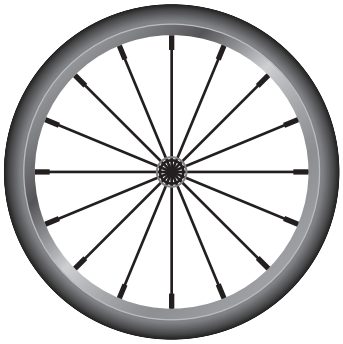
6. $\overset{\frown}{NM}$ and $\overset{\frown}{OP}$



7. $\overset{\frown}{AB}$ and $\overset{\frown}{CD}$

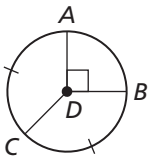


8. The spokes on a bicycle wheel divide the wheel into congruent sections. What is the measure of each arc in this circle?

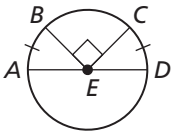


9. Find the measure of each arc.

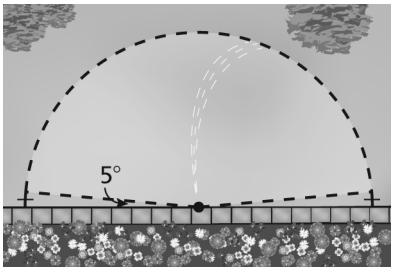
   a. $\overset{\frown}{AC}$



   b. $\overset{\frown}{DAB}$



10. A water sprinkler covers the area shown in the figure. It moves through the covered area at a rate of about 5° per second.



   a. What is the measure of the arc covered by the sprinkler?

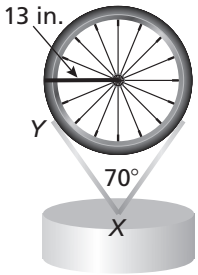
   b. When the sprinkler starts at the far left position, how long will it take for the sprinkler to reach the far right position?

Name _____ Date _____

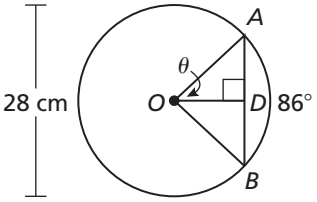
10.2 Enrichment and Extension

Finding Arc Measures

1. A company builds metal stands for bicycle wheels. A new design calls for a V-shaped stand that will hold wheels with a 13-inch radius. The sides of the stand form a 70° angle To the nearest tenth of an inch, what should the length of the side of the V-shaped stand be so that it is tangent to the wheel?



2. In the figure to the right, the diameter of circle O is 28 centimeters. The chord $\overline{AB}$ intercepts an arc whose measure is 86°. What is the length of $\overline{AB}$?

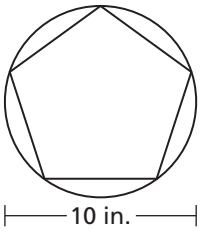


3. Your friend is wrapping 1 meter of twine around a spool with a 2-centimeter diameter. The spool is thin and accommodates only one wrap of twine before the twine stacks on top of itself. The twine has a diameter of $\frac{1}{2}$ centimeter, which increases the diameter of the spool by 1 centimeter with each wrap.

a. Find how many complete times your friend will wrap the twine around the spool.

b. Find the percentage of a complete circle that the last wrapping of the twine will make. Round your answer to the nearest tenth.

4. A regular pentagon is inscribed in a circle with 10-inch diameter. From the center of the circle, construct five congruent triangles.



a. Find the measure of each central angle formed by the triangles.

b. Using trigonometry, find the length of one side of the pentagon.

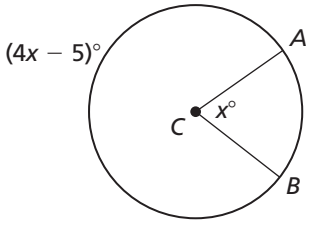
c. Find the perimeter of the pentagon.

d. Find the area of the pentagon.

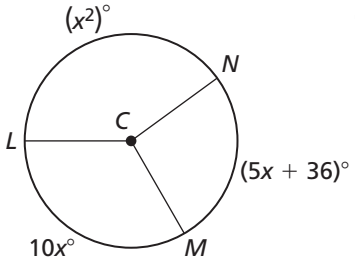
e. Devise a formula that can be used to find the area A of a regular n-gon given the diameter d of its circumscribed circle.

In Exercises 5–7, *C* is the center of the circle. Find the value of *x*.

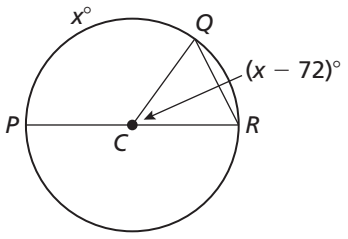
5.



6.



7.



Name_____ Date _____

10.2 Puzzle Time

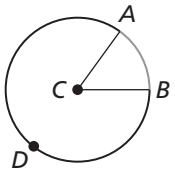
What Fruit Is Always In A Bad Mood?

Circle the letter of each correct answer in the boxes below. The circled letters will spell out the answer to the riddle.

Complete the sentence.

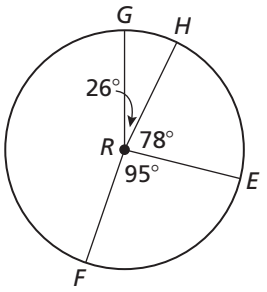
1. A(n) _____ angle of a circle is an angle whose vertex is the center of the circle.
2. The measure of a(n) _____ arc is the measure of its central angle.
3. The measure of a(n) _____ arc is the difference of 360° and the measure of the related minor arc.
4. The measure of an arc formed by two adjacent arcs is the _____ of the measures of the two arcs.
5. Two circles are congruent circles if and only if they have the same _____.
6. All circles are _____.
7. Two arcs are similar arcs if and only if they have the same _____.

Use the diagram.



8. Name the gray minor arc.
9. Name the black major arc.
10. $m\angle ACB = 72°$; Find the measure of $\overset{\frown}{ADB}$.

Use the diagram to find the measure of the arc.



11. $\overset{\frown}{GHE}$
12. $\overset{\frown}{GFE}$

T	A	H	E	C	R	M	E	A	N	P	B
$\overset{\frown}{AB}$	concentric	central	256°	104°	288°	center point	360°	sum	108°	$\overset{\frown}{ABD}$	$\overset{\frown}{ADB}$
O	**A**	**P**	**T**	**A**	**P**	**I**	**L**	**O**	**S**	**E**	**R**
$\overset{\frown}{AD}$	measure	similar	congruent	single	major	difference	radius	large	199°	minor	$\overset{\frown}{AC}$