10-2 Finding Arc Measures

VOCABULARY

Central angle _____.

Semicircle _____.

Arc _____.

Minor arc _____.

Major arc _____.

Measure of a minor arc _____.

Measure of a major arc _____.

Congruent circles _____.

Congruent arcs _____.

The measure of a minor arc is the measure of its _____. The measure of the entire circle is _____. The measure of a major arc is the difference between _____ and the measure of the related minor arc. The measure of a semicircle is _____.

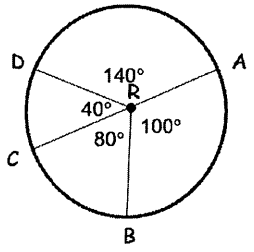
Arc Addition Postulate:

_____

Create a problem using the Arc Addition Postulate and the drawing below:

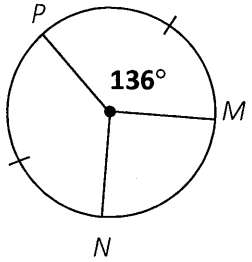
$m\overset{\frown}{DAB}$ =

$m\overset{\frown}{BCA}$ =

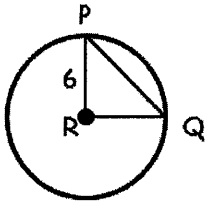


Examples: Refer to the diagrams below-

Calculate $m\overset{\frown}{MN}$.



Find segment PQ. $m\overset{\frown}{PQ}$**=90°**



Circumference and Arc Length

Vocabulary

Circumference _____

_____.

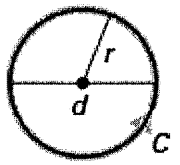
Arc length _____

_____.

Theorem: Circumference of a Circle – The circumference C of a circle is C = _____ or C = _____,

where *d* is the diameter of the circle and *r* is the radius is of the circle.

Example:



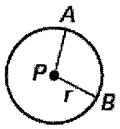
a. **Circumference of a circle with a radius 11 meters:**

$C =$ _____ $=$ _____

b. **Radius of a circle with circumference 18 yards:**

Arc Length Corollary: In a circle, the ratio of the length of a given arc to the circumference is equal to the ratio of the measure of the arc to 360°.

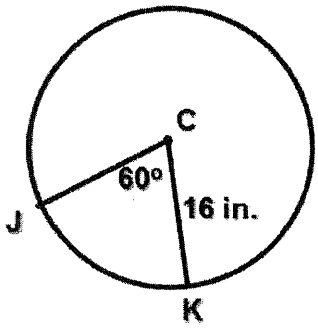
$$\frac{\text{Arc length of } \overset{\frown}{AB}}{2\pi r} = \frac{m\overset{\frown}{AB}}{360°}, \text{ or}$$



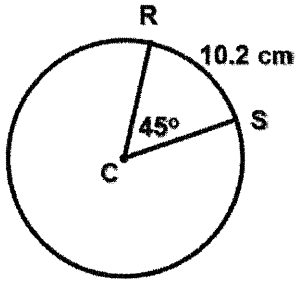
$$\text{Arc length of } \overset{\frown}{AB} = \frac{m\overset{\frown}{AB}}{360°} \cdot 2\pi r$$

Power Point Examples:

Find the length of arc JK.



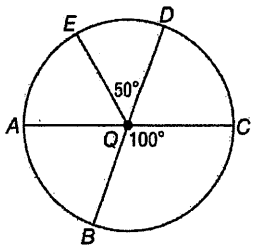
Find the circumference of Circle C.



NAME _____ DATE _____ PERIOD _____

10-2 Practice
Measuring Angles and Arcs

$\overline{AC}$ and $\overline{DB}$ are diameters of $\odot Q$. Identify each arc as a *major arc*, *minor arc*, or *semicircle* of the circle. Then find its measure.



1. $m\widehat{AE}$

2. $m\widehat{AB}$

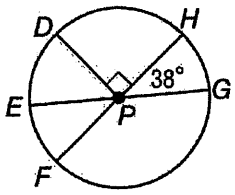
3. $m\widehat{EDC}$

4. $m\widehat{ADC}$

5. $m\widehat{ABC}$

6. $m\widehat{BC}$

$\overline{FH}$ and $\overline{EG}$ are diameters of $\odot P$. Find each measure.



7. $m\widehat{EF}$

8. $m\widehat{DE}$

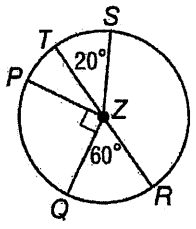
9. $m\widehat{FG}$

10. $m\widehat{DHG}$

11. $m\widehat{DFG}$

12. $m\widehat{DGE}$

Use $\odot Z$ to find each arc length. Round to the nearest hundredth.



13. $\widehat{QPT}$, if $QZ = 10$ inches

14. $\widehat{QR}$, if $PZ = 12$ feet

15. $\widehat{PQR}$, if $TR = 15$ meters

16. $\widehat{QPS}$, if $ZQ = 7$ centimeters

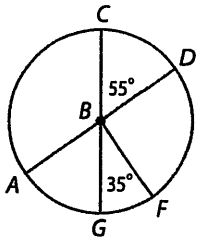
17. **HOMEWORK** Refer to the table, which shows the number of hours students at Leland High School say they spend on homework each night.

Homework	
Less than 1 hour	8%
1–2 hours	29%
2–3 hours	58%
3–4 hours	3%
Over 4 hours	2%

a. If you were to construct a circle graph of the data, how many degrees would be allotted to each category?

b. Describe the arcs associated with each category.

Example 2 $\overline{AD}$ and $\overline{CG}$ are diameters of $\odot B$. Identify each arc as a *major arc, minor arc,* or *semicircle.* Then find its measure.



16. $m\widehat{CD}$ **17.** $m\widehat{AC}$ **18.** $m\widehat{CFG}$

19. $m\widehat{CGD}$ **20.** $m\widehat{GCF}$ **21.** $m\widehat{ACD}$

22. $m\widehat{AG}$ **23.** $m\widehat{ACF}$

Example 3 **24. SHOPPING** The graph shows the results of a survey in which teens were asked where the best place was to shop for clothes.

a. What would be the arc measures associated with the mall and vintage stores categories?

b. Describe the kinds of arcs associated with the category "Mall" and the category "None of these."

c. Are there any congruent arcs in this graph? Explain.

25. CCSS **MODELING** The table shows the results of a survey in which Americans were asked how long food could be on the floor and still be safe to eat.

Dropped Food	
Do you eat food dropped on the floor?	
Not safe to eat	78%
Three-second rule*	10%
Five-second rule*	8%
Ten-second rule*	4%

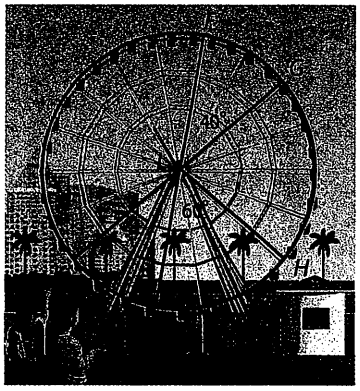
Source: American Diabetic Association
* The length of time the food is on the floor.

a. If you were to construct a circle graph of this information, what would be the arc measures associated with the first two categories?

b. Describe the kind of arcs associated with the first category and the last category.

c. Are there any congruent arcs in this graph? Explain.

Examples 2, 4 **ENTERTAINMENT** Use the Ferris wheel shown to find each measure.



26. $m\widehat{FG}$ **27.** $m\widehat{JH}$

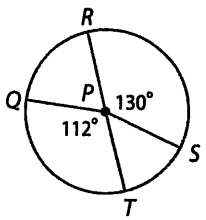
28. $m\widehat{JKF}$ **29.** $m\widehat{JFH}$

30. $m\widehat{GHF}$ **31.** $m\widehat{GHK}$

32. $m\widehat{HK}$ **33.** $m\widehat{JKG}$

34. $m\widehat{KFH}$ **35.** $m\widehat{HGF}$

Example 5 Use $\odot P$ to find the length of each arc. Round to the nearest hundredth.



36. $\widehat{RS}$, if the radius is 2 inches

37. $\widehat{QT}$, if the diameter is 9 centimeters

38. $\widehat{QR}$, if $PS = 4$ millimeters

39. $\widehat{RS}$, if $RT = 15$ inches

40. $\widehat{QRS}$, if $RT = 11$ feet

41. $\widehat{RTS}$, if $PQ = 3$ meters