Name _____ Date _____ Class _____

LESSON 12-2

Reteach

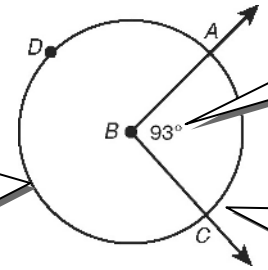
Arcs and Chords

Arcs and Their Measure

- A **central angle** is an angle whose vertex is the center of a circle.
- An **arc** is an unbroken part of a circle consisting of two points on a circle and all the points on the circle between them.

$\overset{\frown}{ADC}$ is a **major arc.**

$m\overset{\frown}{ADC} = 360° - m\angle ABC$
$= 360° - 93°$
$= 267°$



$\angle ABC$ is a central angle.

$\overset{\frown}{AC}$ is a **minor arc**

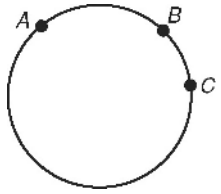
$m\overset{\frown}{AC} = m\angle ABC = 93°$.

- If the endpoints of an arc lie on a diameter, the arc is a semicircle and its measure is 180°.

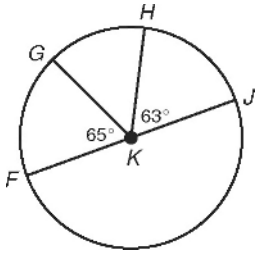
Arc Addition Postulate

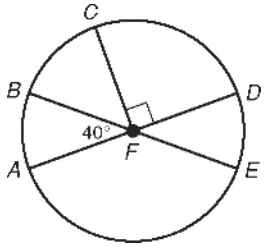
The measure of an arc formed by two adjacent arcs is the sum of the measures of the two arcs.

$m\overset{\frown}{ABC} = m\overset{\frown}{AB} + m\overset{\frown}{BC}$



Find each measure.





1. $m\overset{\frown}{HJ}$ _____

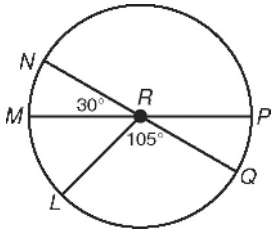
2. $m\overset{\frown}{FGH}$ _____

3. $m\overset{\frown}{CDE}$ _____

4. $m\overset{\frown}{BCD}$ _____

5. $m\overset{\frown}{LMN}$ _____

6. $m\overset{\frown}{LNP}$ _____



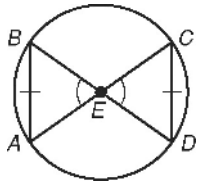
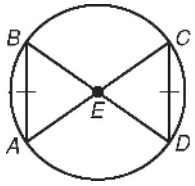
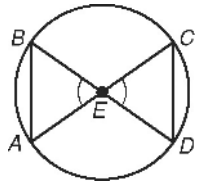
Name _____ Date _____ Class _____

LESSON 12-2

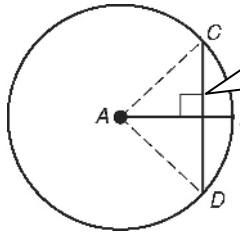
Reteach

Arcs and Chords *continued*

Congruent arcs are arcs that have the same measure.

Congruent Arcs, Chords, and Central Angles		
 If $m\angle BEA \cong m\angle CED$, then $\overline{BA} \cong \overline{CD}$.	 If $\overline{BA} \cong \overline{CD}$, then $\overset{\frown}{BA} \cong \overset{\frown}{CD}$.	 If $\overset{\frown}{BA} \cong \overset{\frown}{CD}$, then $m\angle BEA \cong m\angle CED$.
Congruent central angles have congruent chords.	Congruent chords have congruent arcs.	Congruent arcs have congruent central angles.

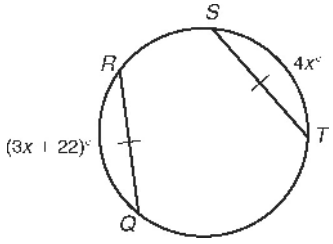
In a circle, if a radius or diameter is perpendicular to a chord, then it bisects the chord and its arc.



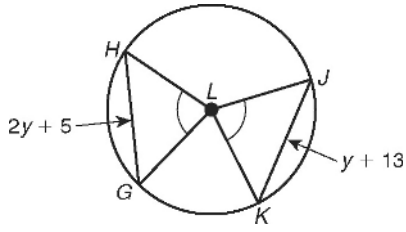
Since $\overline{AB} \perp \overline{CD}$, $\overline{AB}$ bisects $\overline{CD}$ and $\overset{\frown}{CD}$.

Find each measure.

7. $\overline{QR} \cong \overline{ST}$. Find $m\overset{\frown}{QR}$.

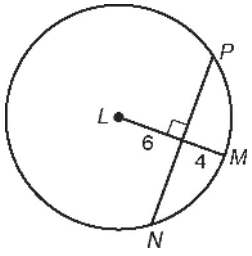


8. $\angle HLG \cong \angle KLJ$. Find GH.

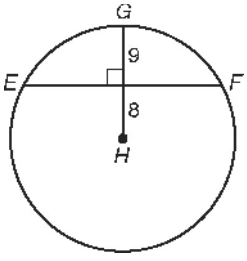


Find each length to the nearest tenth.

9. NP



10. EF



$m\angle QUR$ are each equal to $\frac{1}{2}(180 - m\angle RQU)$. It is given that $\overset{\frown}{RSU} \cong \overset{\frown}{RTU}$, so $m\overset{\frown}{RSU} = m\overset{\frown}{RTU}$. The measure of an arc is equal to the measure of its central angle, so $m\angle RPU = m\angle RQU$. Substitution shows that $m\angle PUR = m\angle PRU = m\angle QRU = m\angle QUR$. $\overline{RU} \cong \overline{RU}$ by the Reflexive Property of Congruence. So $\triangle PRU \cong \triangle QRU$ by SAS. By CPCTC, $\overline{PR} \cong \overline{QR}$ and circles with congruent radii are congruent circles, so $\odot P \cong \odot Q$.

3. 60°
4. 19.2°
5. 53.1°
6. 90°
7. 103.5°
8. 180°
9. $0.2r$
10. $0.8r$
11. $1.9r$

Reteach

1. 63°
2. 117°
3. 130°
4. 140°
5. 75°
6. 225°
7. 88°
8. 21
9. 16.0
10. 30.0

Challenge

1. 86°
2. 47°
3. 43°
4. 14 cm
5. a. $\sin 43° = \frac{AD}{14}$

   b. AD ≈ 9.5 cm

   c. AB ≈ 19.1 cm
6. 1.9 in.
7. 3.0 m
8. 1.3 ft
9. $\ell = d\left(\sin\left[\frac{n}{2}\right]^\circ\right)$

Students' answers may vary slightly.

10. S ≈ 5.9 in.
11. P ≈ 29.4 in.
12. a ≈ 4.1 in.
13. A ≈ 59.4 in^2
14. Formulas may vary in form.

$$A = \frac{1}{4}nd^2\left(\cos\left[\frac{180}{n}\right]^\circ\right)\left(\sin\left[\frac{180}{n}\right]^\circ\right)$$

Problem Solving

1. 270°
2. 72°
3. 154.8°
4. 115.2°
5. C
6. G
7. D

Reading Strategies

1. 60°
2. 360°
3. central angles
4. 32°
5. 263°
6. 328°
7. 295°
8. 32°
9. 65°

12-3 SECTOR AREA AND ARC LENGTH

Practice A

1. $\pi r^3\left(\frac{m^\circ}{360^\circ}\right)$
2. $2\pi r\left(\frac{m^\circ}{360^\circ}\right)$
3. 9π mm^2; 28.27 mm^2
4. 27π mi^2; 84.82 mi^2
5. 982 yd^2
6. 1173 yd^2
7. 25π in^2
8. 50 in^2
9. 28.54 in^2
10. 4π cm; 12.57 cm
11. 3π km; 9.42 km

Practice B

1. sector *BAC* 126 π mm^2; 395.84 mm^2
2. sector *UTV* 30 π in^2; 94.25 in^2
3. sector *KJL* π ft^2; 3.14 ft^2
4. sector *FEG* 100π m^2; 314.16 m^2
5. 4.54 in^2
6. 10.96 km^2
7. 24.47 yd^2
8. 0.29 cm^2
9. 9.83 mi^2
10. π ft; 3.14 ft
11. 14π m; 43.98 m
12. $\frac{\pi}{2}$ mi; 1.57 mi
13. 10π mm; 31.42 mm

Practice C

1. Possible answer: The area of a sector of a circle with radius r and central angle m is $A = \pi r^2\left(\frac{m}{360}\right)$. Half this area is