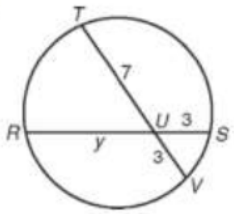
Geometry
HW 12.7
4

Name_____
Period_____ Date_____

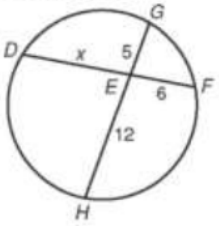
Find the value of the variable and the length of each chord.

1.



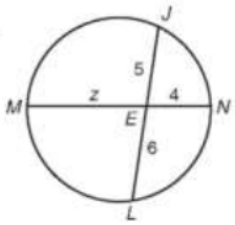
y = 7,RS = 10, TV = 10

2.



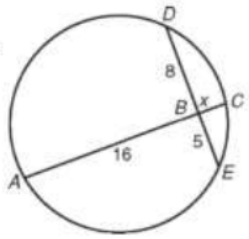
x = 10, DF = 16, GH = 17

3.



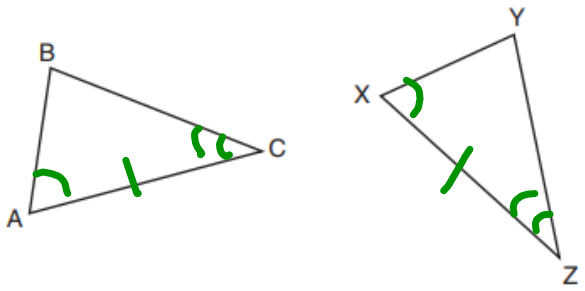
z = 7.5, MN = 11.5, JL = 11

4.



x = 2.5, DE =13, AC = 18.5

30 In the diagram below of $\triangle ABC$ and $\triangle XYZ$, a sequence of rigid motions maps $\angle A$ onto $\angle X$, $\angle C$ onto $\angle Z$, and $\overline{AC}$ onto $\overline{XZ}$.

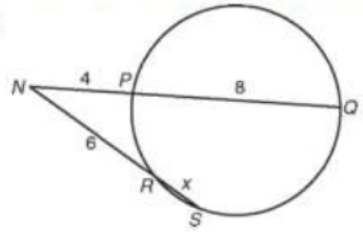


Determine and state whether $\overline{BC} \cong \overline{YZ}$. Explain why.

since rigid motions preserve ∠ measures + distances $\triangle ABC \cong \triangle XYZ$ by ASA $\therefore \overline{BC} \cong \overline{YZ}$ by CPCTC.

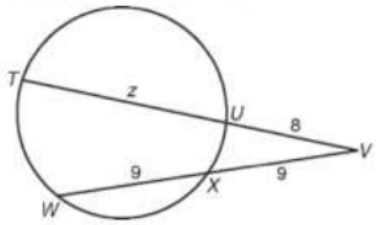
Find the value of the variable and the length of each secant segment.

5.



x= 2, NQ = 12, NS = 8

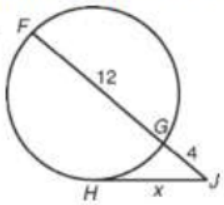
6.



z = 12.25, TV = 20.25, WV = 18

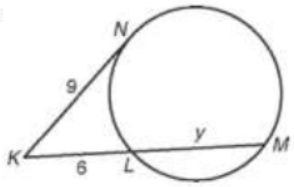
Find the value of the variable.

7.



8

8.



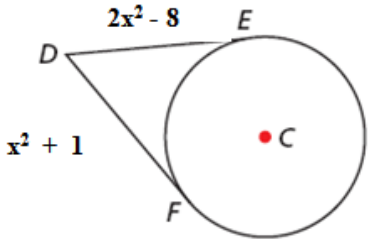
7.5

Class Notes 5/7: **Arcs and Chords**

P18

Warm-up:

Find DE.

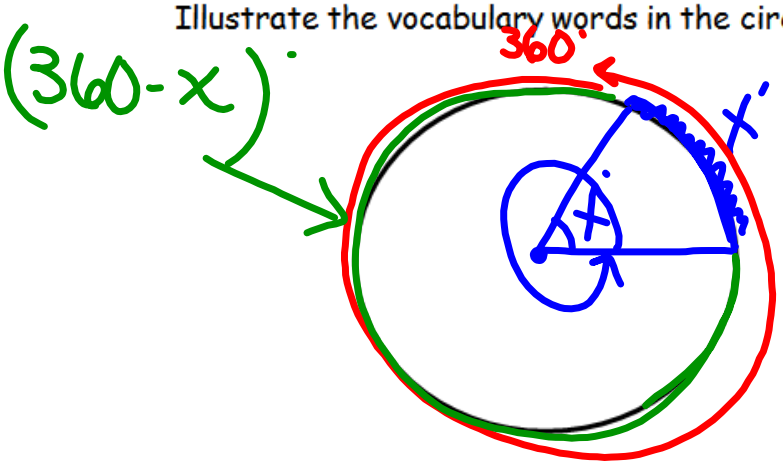


Vocabulary

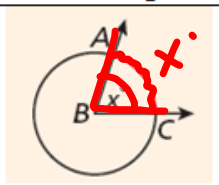
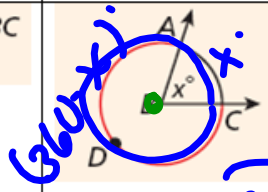
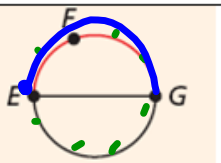
A central ∠ is an angle whose vertex is the center of a circle.

An arc is an unbroken part of a circle consisting of two points called the endpoints and all the points on the circle between them.

Illustrate the vocabulary words in the circle diagram below:

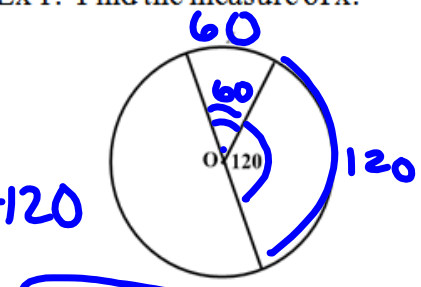


Arcs & Their Measure

Arc	Measure	Diagram
A minor arc is an arc whose points are on or in the interior of a central angle.	$m\overset{\frown}{AC} = m\angle ABC = x°$	
A major arc is an arc whose points are on or in the exterior of a central angle.	$m\overset{\frown}{ADC} = 360° - m\angle ABC$ $= 360° - x°$	
If the endpoints of an arc lie on a diameter, the arc is a semi-circle. ½ a circle	$m\overset{\frown}{EFG} = 180°$	

Example 1: Arc Measure

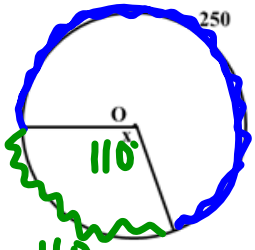
Ex 1: Find the measure of x:



180-120

X = 60°

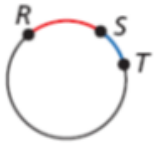
Ex 2: Find the measure of x:



110

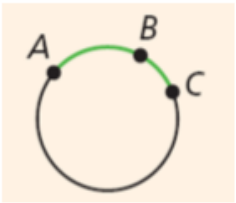
360 - 250 = 110°

Adjacent arcs are arcs of the same circle that intersect at exactly one point. $\overset{\frown}{RS}$ and $\overset{\frown}{ST}$ are adjacent arcs.



Arc Addition Postulate: The measure of an arc formed by two adjacent arcs is the sum of the measures of the arcs.

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



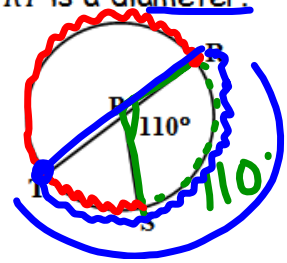
Example 2: Using the Arc Addition Postulate

Find the measure of each arc of circle P, where $\overline{RT}$ is a diameter.

110° = $m\overset{\frown}{RS}$

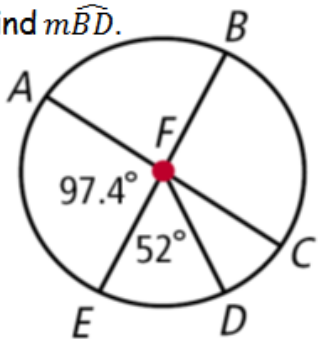
250° = $m\overset{\frown}{RTS}$ 360-110

180° = $m\overset{\frown}{RST}$

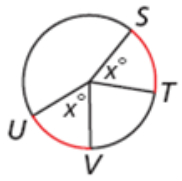


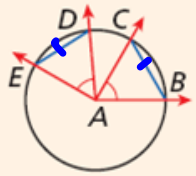
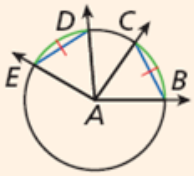
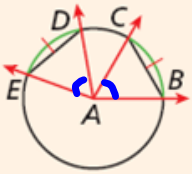
YOU TRY!!

Find $m\widehat{BD}$.



Within a circle or congruent circles, **congruent arcs** are two arcs that have the same measure. In the figure, $\overset{\frown}{ST} \cong \overset{\frown}{UV}$.

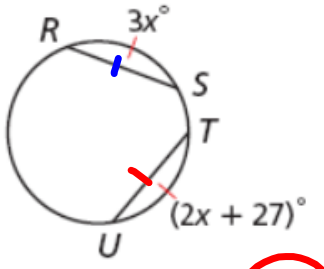


Theorem	Hypothesis	Conclusion
In a circle or congruent circles:		
1) Congruent central angles have congruent chords.	 $\angle EAD \cong \angle BAC$	$\overline{ED} \cong \overline{CB}$
2) Congruent chords have congruent arcs.	 $\overline{ED} \cong \overline{BC}$	$\overset{\frown}{ED} \cong \overset{\frown}{CB}$
3) Congruent arcs have congruent central angles.	 $\overset{\frown}{ED} \cong \overset{\frown}{BC}$	$\angle EAD \cong \angle BAC$

Example 3: Applying Congruent Angles, Arcs, and Chords

Find each measure.

A $\overline{RS} \cong \overline{TU}$. Find $m\overset{\frown}{RS}$.



$\cong$ chords $\rightarrow$ $\cong$ arcs

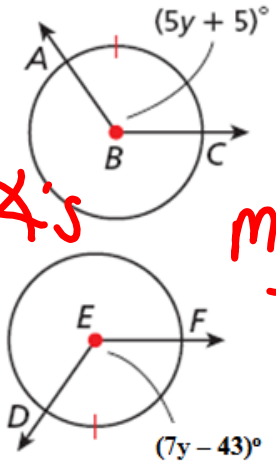
$3x = 2x + 27$

$x = 27$

$m\overset{\frown}{RS} = 3(27) = 81°$

$\overset{\frown}{TU}$ $\overset{\frown}{TU}$

B $\odot B \cong \odot E$, and $\overset{\frown}{AC} \cong \overset{\frown}{DF}$. Find $m\angle DEF$.



$\cong$ arcs $\rightarrow$ $\cong$ central $\angle$'s

$5y + 5 = 7y - 43$

$y = 24$

$m\angle DEF =$

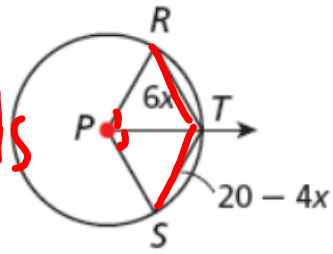
$7(24) - 43$

$= 125°$

TRY IT!

Find each measure.

A) $\overrightarrow{PT}$ bisects $\angle RPS$. Find RT.



≅ central ∠'s → ≅ chords

$6x = 20 - 4x$

$x = 2$

$RT = 6(2) = 12$

B) $\odot A \cong \odot B$, and $\overline{CD} \cong \overline{EF}$.

Find $m\overset{\frown}{CD}$.