Lesson 11-2: Lines that Intersect Circles

AGENDA

- Check HW 11.1
- Lesson Notes & **Guided Practice (fill in graphic org)**

HOMEWORK

p 761 # 15, 25-30, 38, 39, 48

QUIZ - NEXT CLASS!

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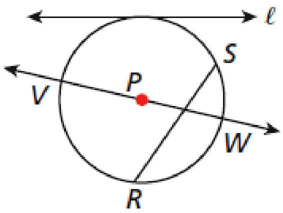
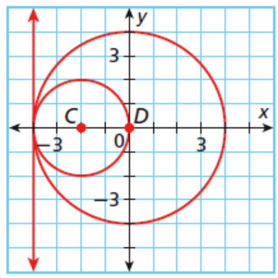
p 752-53: #11,13, 16-27

11.



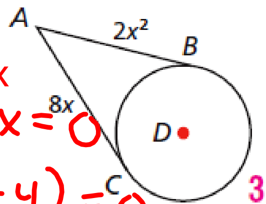
chords: $\overline{RS}$, $\overline{VW}$; secant: $\overleftrightarrow{VW}$; tangent: ℓ; diam.: $\overline{VW}$; radii: $\overline{PV}$, $\overline{PW}$

13.



radius of ⊙C: 2; radius of ⊙D: 4; pt. of tangency: $(-4, 0)$; eqn. of tangent line $x = -4$

16. AB



$2x^2 = 8x$

$2x^2 - 8x = 0$

x=4

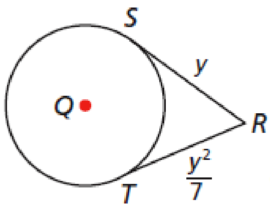
$2x(x-4) = 0$

$x = 0 \mid x - 4 = 0$

$x = 4$

32

17. RT



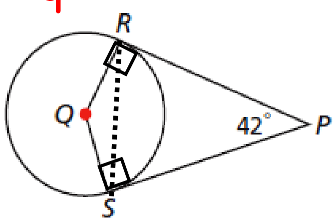
7

$\frac{y^2}{7} = y$

$y = 7$

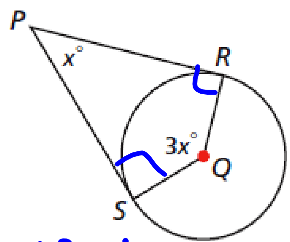
26. m∠Q

138°



27. m∠P

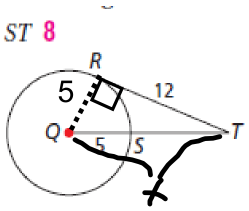
45°



$4x + 180° = 360°$

31. ST 8

32



18. Two circles with the same center are congruent. S

19. A tangent to a circle intersects the circle at two points. N

20. Tangent circles have the same center. N

21. A tangent to a circle will form a right angle with a radius that is drawn to the point of tangency. A

22. A chord of a circle is a diameter. S

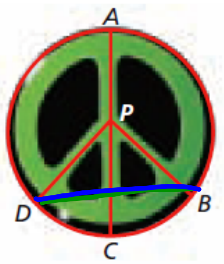
Graphic Design Use the following diagram for Exercises 23–25.

The peace symbol was designed in 1958 by Gerald Holtom, a professional artist and designer. Identify the following.

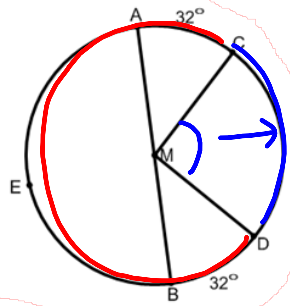
23. diameter $\overline{AC}$

24. radii $\overline{PA}$, $\overline{PB}$, $\overline{PC}$, $\overline{PD}$

25. chord $\overline{AC}$



Note how the arcs are measured in degrees!



Arc Vocabulary

Fill in the definitions and an example of each using ⊙M.

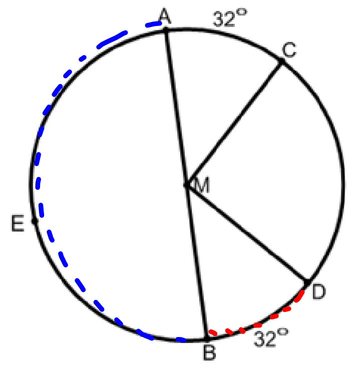
- **Central Angle –** an ∡ whose vertex is the CENTER of the circle. Ex: ∡CMD
  - **Note:** a central angle **intercepts** an arc (the endpoints and all points on the circle between them) of the circle. The measure of the intercepted arc is EQUAL TO the degree measurement of its central ange.

    Ex: $m\angle CMD = m\overset{\frown}{CD}$

- **Major Arc –** the arc on the EXTERIOR of a central angle.
  - Named by 3 points.
  - Ex: $\overset{\frown}{CAD}$

$\overset{\frown}{CAD}$

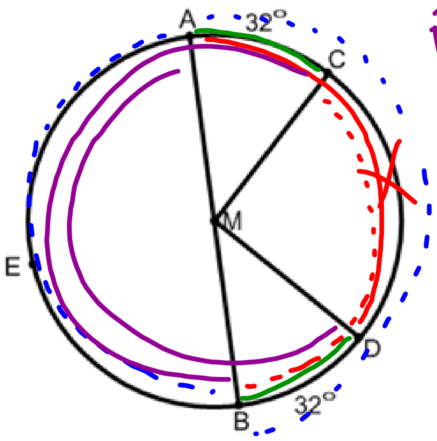
- **Minor Arc –** the arc on the INTERIOR of a central angle.
  - Named by 2 points.
  - Ex: $\overset{\frown}{CD}$



- **Semicircle –** an arc whose endpoints are a DIAMETER of the circle.
  - Named by 3 points.
  - Ex: AEB
  - **Note:** a central angle that intercepts a semicircle (180°) is a STRAIGHT ∡.
- **Adjacent Arcs –** arcs on the same circle that share a COMMON ENDPOINT
  - Ex: AEB & BD

- **Congruent Arcs** – arcs which have SAME MEASURE
  - Ex: AC & BD
  - Ex: AEB & ACB
  - Ex: CAB & DBA
  - Ex: AD & BC

OVERLAPPING ARC THEOREM



Arc Addition Postulate

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

Example: Find the measure of each arc.

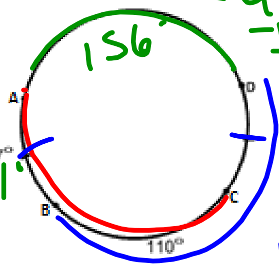
1) $m\widehat{AC} = m\widehat{AB} + m\widehat{BC}$

$47° + 110° = 157°$

2) $m\widehat{AD} = 360° - m\widehat{ACD} = 360° - 204° = 156°$

3) $m\widehat{ADC} = m\widehat{AD} + m\widehat{DC} = 156° + 47° = 203°$

4) $m\widehat{DCB} = 157°$



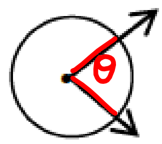
$360 - 47 - 47 - 110$

$47° + 110° = 157°$

Fill in graphic organizer (front)

∡ and *arc* relationships

last column

Center of circle

CENTRAL (EXTENDED) RADII
$\theta° = m\widehat{ARC}°$

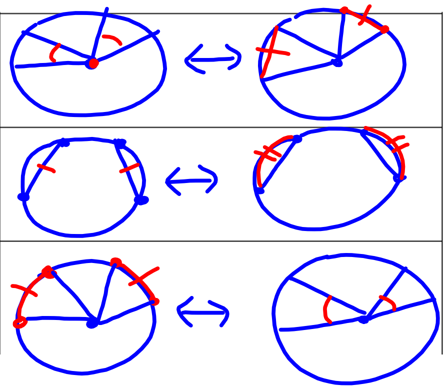
Theorem 11-2-2

THEOREM	HYPOTHESIS	CONCLUSION
In a circle or congruent circles:		
(1) Congruent central angles have congruent chords.	$\angle EAD \cong \angle BAC$	$\overline{DE} \cong \overline{BC}$
(2) Congruent chords have congruent arcs.	$\overline{ED} \cong \overline{BC}$	$\overset{\frown}{DE} \cong \overset{\frown}{BC}$
(3) Congruent arcs have congruent central angles.	$\overset{\frown}{ED} \cong \overset{\frown}{BC}$	$\angle DAE \cong \angle BAC$

In a ⊙ circle or 2 ≅ ⊙'s , ≅ ________ ↔ ≅ ________ ↔ ≅ ________

*Fill in graphic organizer *

	• ≅ central angles have ≅ chords	One ⊙ or 2 ≅ ⊙'s	
	• ≅ chords have ≅ arcs		
...cs and ...hords	• ≅ arcs have ≅ central angles		



Example: Given ⊙F, find the following:

a) $m\overset{\frown}{CDE}$ = $m\overset{\frown}{CD} + m\overset{\frown}{DE}$

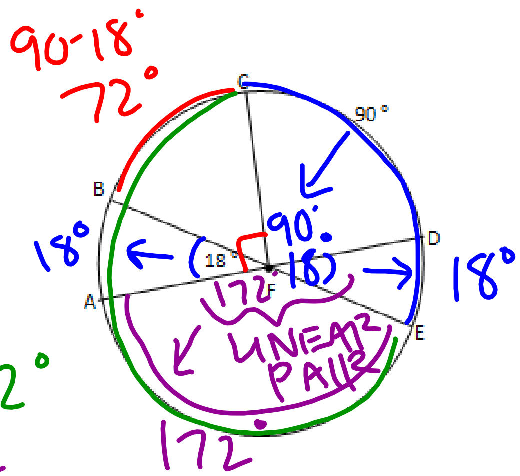
$90° + 18° = 108°$

b) $m\overset{\frown}{BC}$ 72°

c) $m\overset{\frown}{CAE}$

$72° + 18° + 172° = 262°$

d) $m\angle AFE$ 172° θ = m ARC



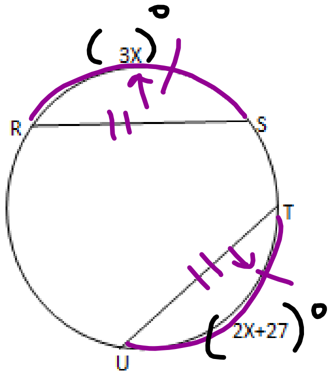
Practice:

1) $\overline{RS} \cong \overline{TU}$. Find the measure of $\widehat{RS}$.

$3x = 2x + 27$

$x = 27$

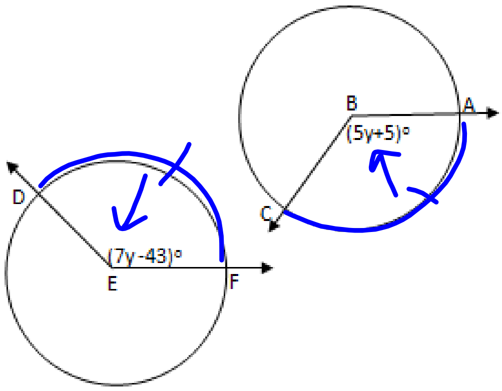
$3(27) = 81^\circ = m\widehat{RS}$



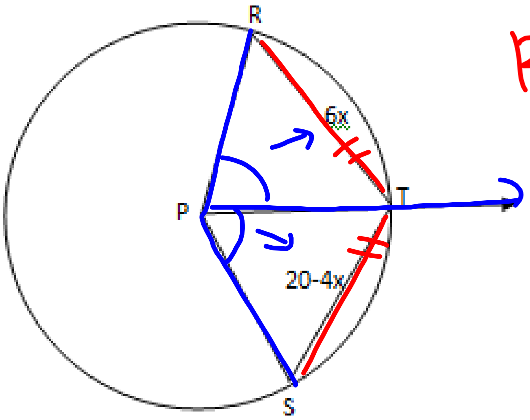
2) $\odot B \cong \odot E$. $\widehat{AC} \cong \widehat{DF}$. Find the measure of $\measuredangle DEF$.

$\measuredangle DEF \cong \measuredangle ABC$

$7y - 43 = 5y + 5$

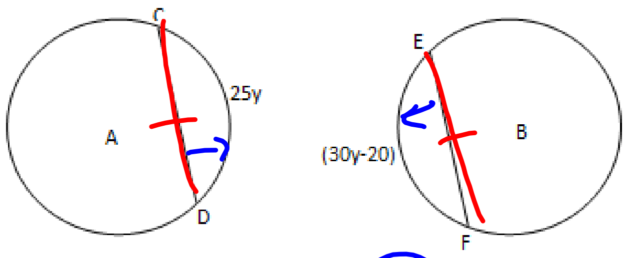


3) $\overline{PT}$ bisects $\angle RPS$ in $\odot$P. Find RT.



RT = ST
6x = 20-4x

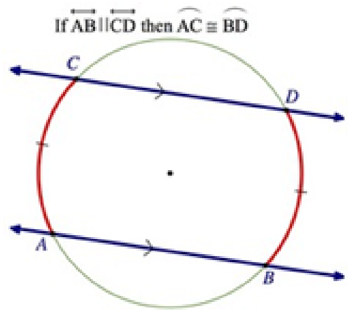
4) $\odot A \cong \odot B$. $\overline{CD} \cong \overline{EF}$. Find $m\widehat{CD}$.



$\widehat{CD} \cong \widehat{EF}$
25y = 30y - 20

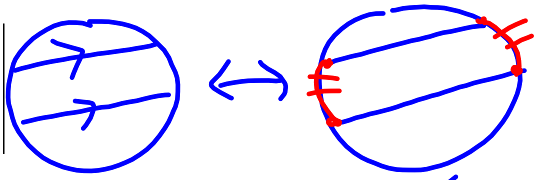
Parallel Chords

Theorem: In a circle, parallel chords intercept congruent arcs.



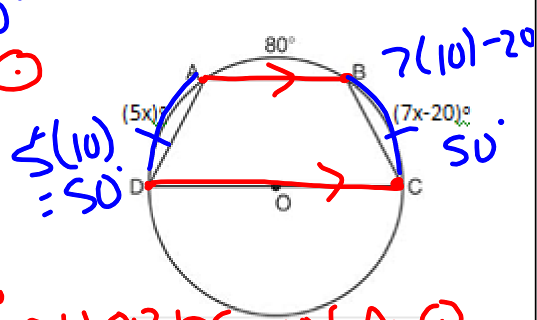
*Fill in graphic organizer

Arcs and Chords	• Parallel chords intercept congruent arcs



AS LONG AS NOT INTERSECTING

Example: Given trapezoid ABCD inscribed in circle O, 1) explain why the trapezoid is an isosceles trapezoid and 2) find the measure of $\overset{\frown}{AC}$. $= 80° + 50° = 130°$



|| CHORDS IN A ⊙ → ARCS ≅

$\overset{\frown}{AD} \cong \overset{\frown}{BC}$

≅ ⌒'s HAVE ≅ CHORDS IN A ⊙

$\overline{AD} \cong \overline{BC}$ → TRAP ABCD ISOS

$5x = 7x - 20$
$20 = 2x$
$10 = x$

Attachments

Bridge to Unit 11 KEY.docx