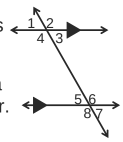
Monday, February 4, 2013

Agenda:

- TISK, No MM
- Homework Check
- Lesson 9-2: Angles & Arcs
- Homework: 9-2 problems in packet

TISK Problems

1. Simplify completely: $\frac{4x+8}{2x}$
2. Write the equation of a line in slope-intercept form that passes through the point (4,9) and is perpendicular to the line $y = \frac{4}{3}x + 2$.
3. Name two angles congruent to angle 1; give a theorem or postulate that justifies your answer.



Graded Work

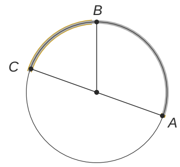
- Chapter 7 Test
  - 9A
    - Class Average: 70.8%
    - Class Median: 73.8%
    - Highest: 98.8%
    - Lowest: 27.6%
  - 9B
    - Class Average: 84.6%
    - Class Median: 82.7%
    - Highest: 100%
    - Lowest: 70%

Homework Check

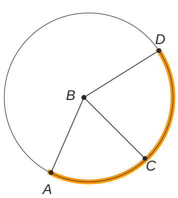
1. S
2. $\overline{SR}, \overline{SM}, \overline{ST}$
3. $\overline{RT}$
4. $\overline{XY}$ or $\overline{RT}$
5. $SM = 4.1$
6. Yes, $\overline{SR} \cong \overline{SM}$ because they're radii in the same circle.
7. $d = 14, C = 14\pi$
8. $d = 37.08,$ $r = 18.54$
9. $r = 16.2, C = 32.4\pi$
10. $r = \frac{9}{\pi}, d = \frac{18}{\pi}$
11. $C = 8\pi$ cm
12. $C = 13\pi$ cm
13. $C = 6\pi\sqrt{2}$ cm

§9.2 Angles & Arcs

- Definitions
  - Arc: part of the circumference of a circle.
  - Major Arc: more than half a circle
  - Minor Arc: less than half a circle
  - Semicircle: Exactly half a circle
- Naming Conventions
  - When naming arcs, we use: $\overset{\frown}{AB}$
  - This convention always indicates the SHORTEST path from A to B.
  - To name a major arc or semicircle, we thus need three letters: $\overset{\frown}{ACB}$



Practice: Name the shaded arc in each picture.
Then tell whether it is a *minor arc*, *major arc*, or a *semicircle*.

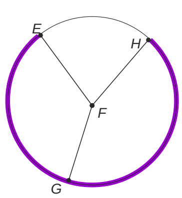


$\overset{\frown}{DA}$

minor

Practice: Name the shaded arc in each picture.
Then tell whether it is a *minor arc*, *major arc*, or a *semicircle*.

$\overset{\frown}{EGH}$

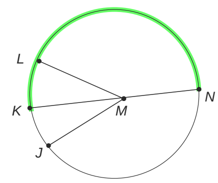


Major

Practice: Name the shaded arc in each picture.
Then tell whether it is a *minor arc*, *major arc*, or a *semicircle*.

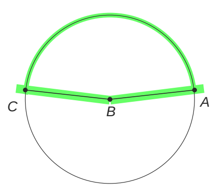
KLN

Semi circle



Definitions, Properties, Theorems, & Postulates

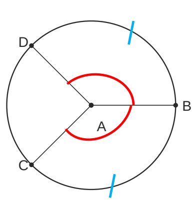
- Central Angle
  - An angle whose vertex is on the center of the circle.
- Property of Central Angles
  - A central angle's measure is equal to the measure of its intercepted arc.
- Sum of Central Angles Theorem
  - The sum of the measures of the central angles of a circle is 360°.
- Arc Addition Postulate
  - Same as Segment or Angle Addition Postulates! Any arc is equal to the sum of its components.



$mAC = m\angle ABC$

Theorem

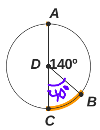
- In the same circle, or in congruent circles, two arcs are congruent if and only if their corresponding central angles are congruent.



If $\angle BAD \cong \angle BAC \Rightarrow BD \cong BC$

If $BD \cong BC \Rightarrow \angle BAD \cong \angle BAC$

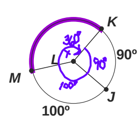
Practice. Find the indicated measure.



$m\angle BDC = m\widehat{BC}$

$\boxed{40° = m\widehat{BC}}$

Practice. Find the indicated measure.



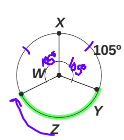
$\boxed{m\widehat{KM} = 170°}$

$x + 90 + 100 = 360$

$x + 190 = 360$

$x = 170$

Practice. Find the indicated measure.



$m\widehat{ZX} = 105°$

$360 = 105 + 105 + m\angle ZWY$

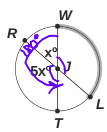
$360 = 210 + m\angle ZWY$

$m\angle ZWY = 150$

$m\widehat{ZY} = m\angle ZWY$

$\boxed{m\widehat{ZY} = 150°}$

Practice. Find the indicated measure.



$5x + x = 180°$

$6x = 180°$

$x = 30°$

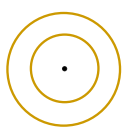
$m\angle WJL = m\angle RJT = 5(30) = 150°$

$\boxed{m\overset{\frown}{WL} = m\angle WJL = 150°}$

More Definitions

- Definitions
  - Concentric circles

  Two circles with the same center, but different radii.



Congruent Arcs

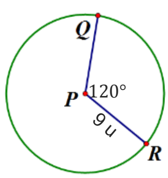
- Recall:
  - In the same circle, or in congruent circles, two arcs are congruent if and only if their corresponding central angles are congruent.
  - Why do they have to be in the same or congruent circles?

Arc Length

- Arcs have both measure and length.
  - The measure is in degrees.
  - The length is in distance units.
- The length of an arc is defined as a fraction of the circle's circumference.
  - Let r = radius and d = the arc's measure Then, ℓ =the length of the arc.
  - $\ell = \frac{d}{360°}(2\pi r)$

Example

- Find the length of QR given $\odot P$, $PR = 9$ and $m\angle QPR = 120°$.



$\ell = \frac{120}{360}(2\pi 9)$

$\ell = \frac{1}{3}(18\pi)$

$\ell = 6\pi\ units$