BE – Geometry 11

Monday 1-23-12

① What is the difference between arc measure and arc length?

② The following car ownership survey was done – construct a circle to represent.

Make	Number of Owners
Ford	13
GM	17
Toyota	20

③ What is the arc length of $\overset{\frown}{AB}$

$\odot C$ radius = 12 cm and $m\angle ACB = 20°$

Homework Review Pg 532-3, #1-13 odd
#20, 32.

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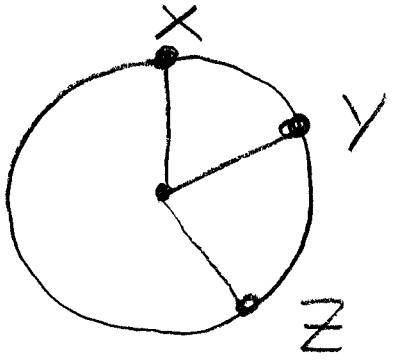
(1)



$\overset{\frown}{XY}$ or $\overset{\frown}{YX}$

$\overset{\frown}{YZ}$ or $\overset{\frown}{ZY}$

$\overset{\frown}{XZ}$ or $\overset{\frown}{XYZ}$

$\overset{\frown}{XYZ}$ or $\overset{\frown}{ZYX}$

$m\overset{\frown}{XY} \sim 45°$

$m\overset{\frown}{YZ} \sim 75°$

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(3) Concentric ⇒ different (size) circles with same center point.

Congruent ⇒ same size circles with different center point.

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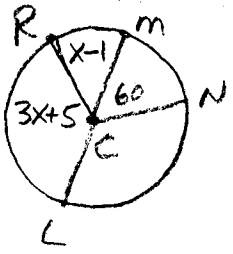
(5) $m\angle RCL = ?$



$(3x+5)+(x-1)=180°$

$3x+x+5-1=180$

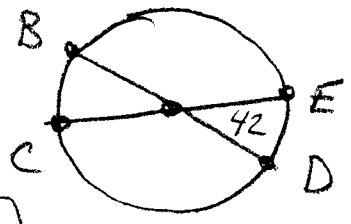
$4x = 176$

$x = 44$

$\therefore m\angle RCL = 3(44)+5 = \boxed{137°}$

(7) $m\angle RCN = ?$ ⇒ $(x-1)+60 = 43+60 = \boxed{103°}$

(9) $\odot A$, $m\angle EAD = 42°$



$m\overset{\frown}{CBE} = ?$

$m\overset{\frown}{CBE}$ = semicircle = $\boxed{180°}$

(11) $m\overset{\frown}{CD} = ?$ $\quad m\overset{\frown}{CD} \Rightarrow 180 - 42 = \boxed{138°}$

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(13) Total $\Rightarrow$ 1400 CFO's $\quad$ *(Nearest degree)

Find, measure of each $\angle$ on circle graph.

$2\% \Rightarrow \frac{2}{100} \cdot 360 \approx 7.2 = \boxed{7°}$

$22\% \Rightarrow \frac{22}{100} \cdot 360 \approx 11(7.2) = 79.2 \approx \boxed{79°}$

$25\% \Rightarrow \frac{1}{4} \cdot 360 \approx \boxed{90°}$

$28\% \Rightarrow 25\% + 1\% + 1\% + 1\% \qquad 1\% = 3.6$

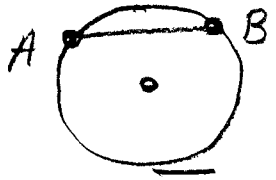
$\Rightarrow 90° + (3.6)3 = 90° + 10.8 = 100.8 = \boxed{101°}$

$23\% \Rightarrow 22\% + 1\% = 79.2 + 3.6$

$= 82.8 = \boxed{83°}$

10-3 Arcs and Chords

The endpoints of a chord are also endpoints of an arc



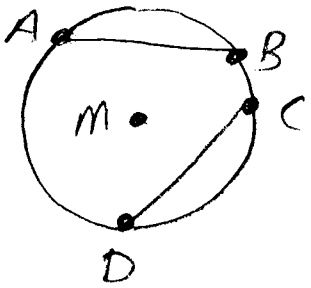
Chord $\overline{AB}$

Arc $\overset{\frown}{AB}$

Theorem 10.2

In a $\odot$, 2 minor arcs $\cong$ iff the corresponding chords are $\cong$

(Ex)

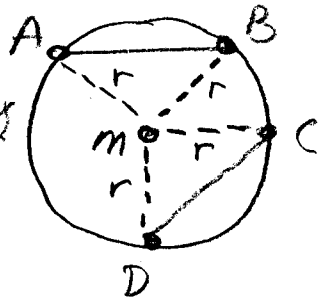


If $\overline{AB} \cong \overline{DC}$
then $\overset{\frown}{AB} \cong \overset{\frown}{DC}$

Also:
If $\overset{\frown}{AB} \cong \overset{\frown}{DC}$
Then $\overline{AB} \cong \overline{DC}$

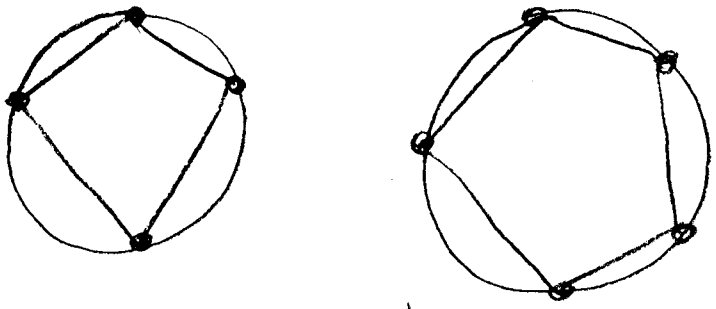
Proof: Given $\odot M$, $\overset{\frown}{AB} \cong \overset{\frown}{DC}$
Prove: $\overline{AB} \cong \overline{DC}$

Statement	Reason
1. $\odot M$, $\overset{\frown}{AB} \cong \overset{\frown}{DC}$	Given
2. $\angle AMB \cong \angle DMC$	If arcs $\cong$, corresponding central $\angle$s $\cong$
3. $AM \cong BM \cong DM \cong CM$	All radii $\cong$
4. $\triangle AMB \cong \triangle DMC$	SAS
5. $\overline{AB} \cong \overline{CD}$	CPCTC



The chords of adjacent can form a polygon. This is called an inscribed polygon because all the vertices are inside the circle

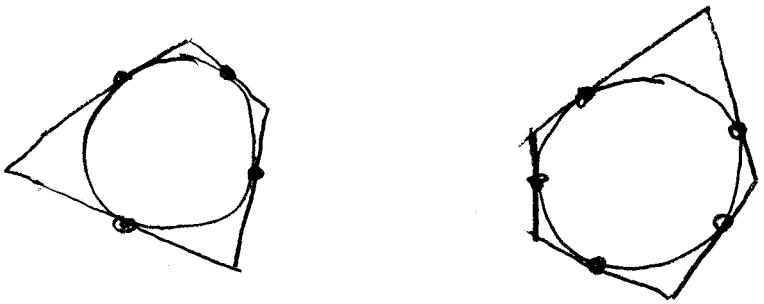
(Ex)



The circles are circumscribed because they contain the vertices of the polygons.

If the circle is inscribed in a polygon, every side of the polygon that is circumscribed around the circle is tangent to the circle at every side.

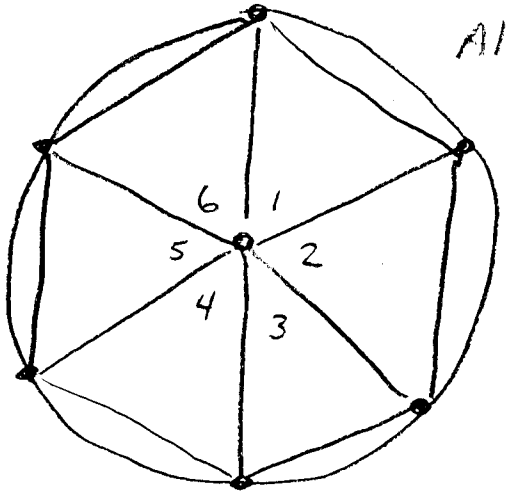
(Ex)



A Regular polygon has all sides that are $\cong$. Therefore, in an inscribed polygon, all of the central $\angle$s in a regular polygon are $\cong$

(Ex)
See Ex 2 Pg 537

All sides $\cong$
All central $\angle$s $\cong$



What is the measure of each central angle?

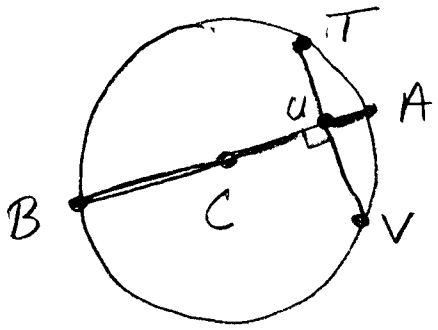
$$\frac{360}{6} = 60^\circ$$

Note: all 6 $\triangle$'s are $\cong$ and are equilateral with each $\angle = 60^\circ$

Diameters and Chords — Perpendicular

Diameters that are perpendicular to chords have the following properties:

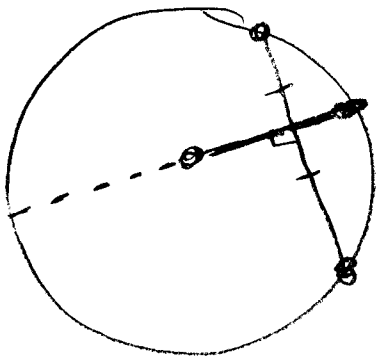
Theorem 10.3 In a circle, if a diameter (or radius) is $\perp$ to chord, it bisects the chord and its arc



Chord $\overline{TV}$
dia $\overline{BA}$

$\overline{Tu} \cong \overline{Vu}$, $\widehat{TA} \cong \widehat{VA}$

Same if radius



FINALLY:

Theorem 10.4 In a circle, 2 chords are $\cong$ iff they are equidistant from center

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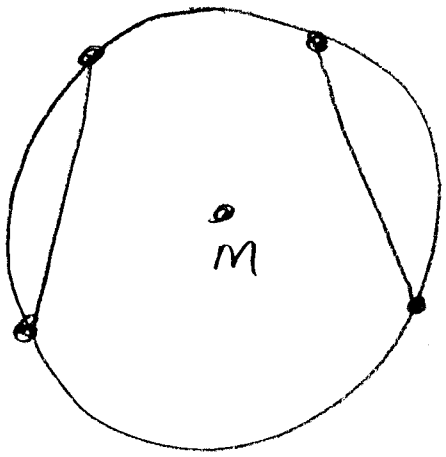
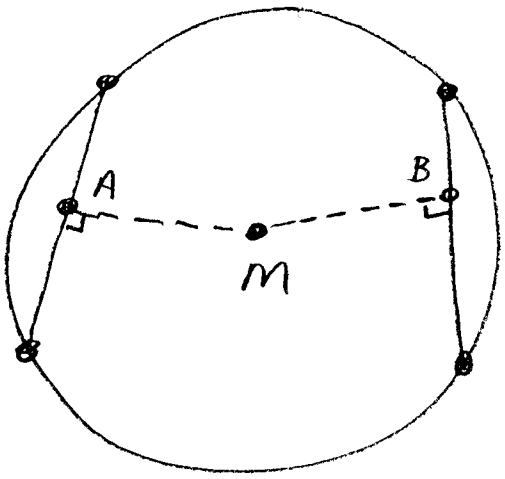
(EX)



How to find distance from center?



Perpendicular

If $\overline{MA} \cong \overline{MB}$ then chords and arcs $\cong$

HW: Pg 534 #47-50, 52.
Pg 540 to 541 # 11-17 odd, 23-25, 39.