

LESSON: CHORD PROPERTIES

HW: p. 63 #1-7

OPENER: HW QUESTIONS FROM PARTS OF A CIRCLE & TANGENTS

VOCAB: REVIEW CENTRAL ANGLE (FORMED BY 2 RADII)

INSCRIBED ANGLE: ANGLE FORMED BY 2 CHORDS

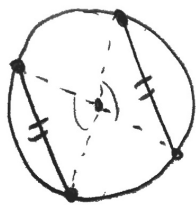
MINOR ARC: MEASURES $< 180^\circ$

MAJOR ARC: MEASURES $> 180^\circ$

SEMICIRCLE: MEASURES 180° EXACTLY

ACTIVITIES

#1



DRAW A CIRCLE WITH TWO CONGRUENT CHORDS. MEASURE THE CENTRAL ANGLES FORMED BY THE CHORDS.

- WHAT CAN YOU CONCLUDE ABOUT THE CENTRAL ANGLE MEASURES? THE ARC MEASURES?

① CHORD CENTRAL ANGLES CONJECTURE

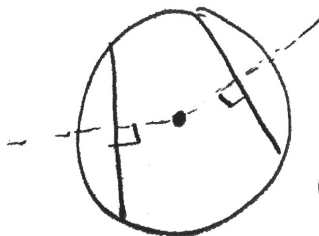
IF 2 CHORDS IN A CIRCLE ARE CONGRUENT, THEY DETERMINE 2 CENTRAL ANGLES THAT ARE CONGRUENT.

② CHORD ARCS CONJECTURE

IF 2 CHORDS IN A CIRCLE ARE CONGRUENT, THEN THEIR INTERCEPTED ARCS ARE CONGRUENT.

③ THE PERPENDICULAR TO A CHORD CONJECTURE

THE PERPENDICULAR FROM THE CENTER OF A CIRCLE TO A CHORD IS THE BISECTOR OF THE CHORD

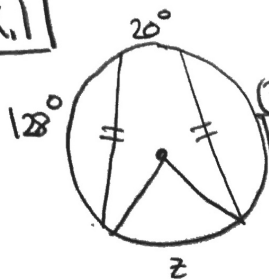


④ 2 CONGRUENT CHORDS IN A CIRCLE ARE EQUIDISTANCE FROM THE CENTER OF THE CIRCLE.

⑤ THE PERPENDICULAR BISECTOR OF A CHORD PASSES THROUGH THE CENTER OF THE CIRCLE

EXAMPLES

EX. 1



FIND Z

① 128°

① CONGRUENT CHORDS \rightarrow CONGRUENT ARC MEASURES

② ALL ARC MEASURES SUM TO 360°

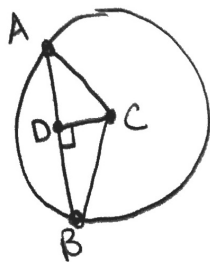
$$2(128^\circ) + 20^\circ + z = 360^\circ$$

$$256 + 20 + z = 360$$

$$276 + z = 360$$

$$z = 84^\circ$$

EX. 2



GIVEN: $AB = 14 \text{ cm}$ $\widehat{AB} = 110^\circ$

$\angle CAD = ?$ $DB = ?$

$m\angle CAD + m\angle CBD + m\angle ACB = 180^\circ$ (TRIANGLE)

THESE ARE EQUAL BECAUSE THEY ARE THE BASE ANGLES OF AN ISOSCELES Δ FORMED BY THE RADIUS & THE CHORD

GIVEN BY $m\widehat{AB}$

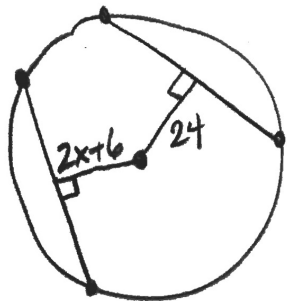
$$2x + 110^\circ = 180 \Rightarrow 2x = 70 \Rightarrow x = 35^\circ$$

BECAUSE \overline{CD} IS \perp TO CHORD \overline{AB} , IT BISECTS THE CHORD.

$$DB = \frac{14}{2} = 7 \text{ cm} = DB$$

$$m\angle CAD = 35^\circ$$

EX. 3



$\overline{AB} \cong \overline{CD}$. Find x.

* congruent chords are equidistant from the center

$$2x + 6 = 24$$

$$2x = 18$$

$$x = 9$$