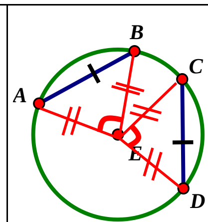
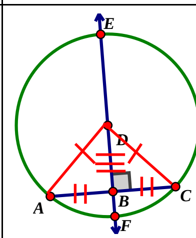
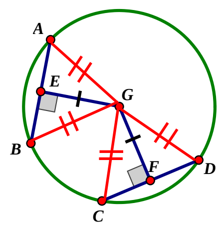
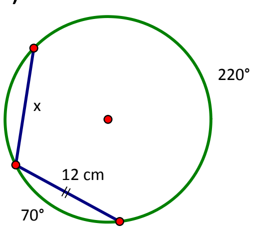
Geometry (G.C.2) Name: ______________________
Unit Five: Circles – Chords (IC3) Date: ___________ Period: _______

Review: What is a chord? A segment with both endpoints ON the circle		
Chord Theorem #1: In the same circle or in congruent circles, if two chords are congruent then… The arcs they intersect are ≅	 $\widehat{AB} \cong \widehat{CD}$ ΔAEB ≅ ΔCED by SSS, so central ∠'s ≅ as well by CPCTC ⟶ arcs ≅	**Converse?** T/F
Chord Theorem #2: If a diameter of a circle is perpendicular to a chord, then… It bisects the chord	 $\overline{AB} \cong \overline{CB}$ ΔABD ≅ ΔCBD by HL, so $\overline{AB} \cong \overline{CB}$ by CPCTC	**Converse?** T/F
Chord Theorem #3: If two chords are equidistant from the center, then… they are ≅ to each other	 $\overline{AB} \cong \overline{CB}$ All 4 Δ's ≅ by HL, so chords are ≅ also	**Converse?** T/F

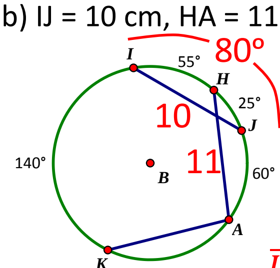
1. Determine the requested value.

a)



x = 12cm

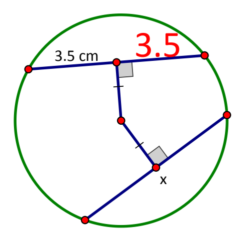
b) IJ = 10 cm, HA = 11 cm



$\overline{IJ} \cong \overline{AK}$

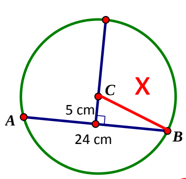
AK = 10cm

c)



x = 7cm

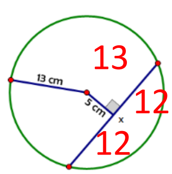
d)



$5^2 + 12^2 = x^2$
x = 13

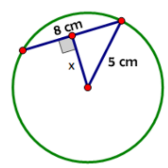
AC = 13cm

e)



x = 24cm

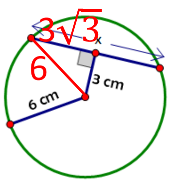
f)

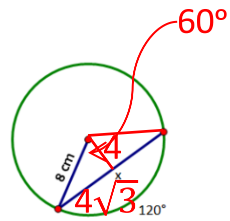


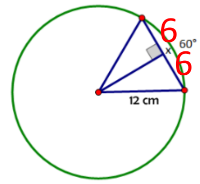
$4^2 + x^2 = 5^2$
x = 3

x = 3cm

2. Determine the requested value.

a) 

b) 

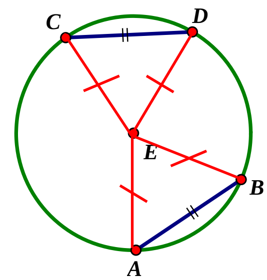
c) 

x = $6\sqrt{3}\ cm$ (E)

x = $8\sqrt{3}\ cm$ (E)

x = $12\ cm$ (E)

3. A student questions the teacher…. "It makes sense that if you have congruent chords you would have congruent arcs but can you prove it?" Help the teacher by proving this to be true.



- $\Delta CED \cong \Delta AEB$ by SSS (radii ≅ and chords ≅)
- $\angle CED \cong \angle AEB$ by CPCTC
- $\widehat{CD} \cong \widehat{AB}$ since central angles ≅ arc measure will be the same.

4. Why would the perpendicular bisector of a chord have to be a diameter?

Points on a ⊥ bisector are always equidistant from the endpoints of the bisected segment. The only way for this to be true is if the ⊥ bisector is the diameter b/c it would divide the circle in half.

5. An ancient plate from the Mayan time period was dropped at a museum. The curator wanted to put it back together but needed to find the center of the plate for the restoration. If the largest piece looked like this… how could they find the center of the plate?

Find the intersection of 2 ⊥ bisectors of chords (diameters) since they would have to intersect at the circle's center.