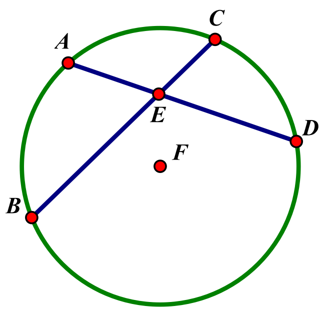
Circles – Intersecting Chord Properties

G.C.A.2 Notes Section 13.5 Name____________________

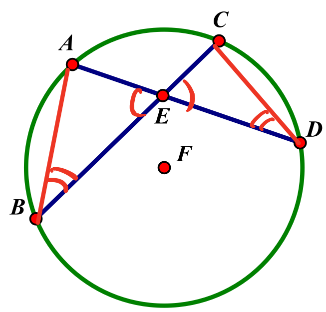
Theorem: If two chords intersect in a circle, then the products of the measures of the segments of the chords are equal.



$AE \cdot ED = BE \cdot EC$

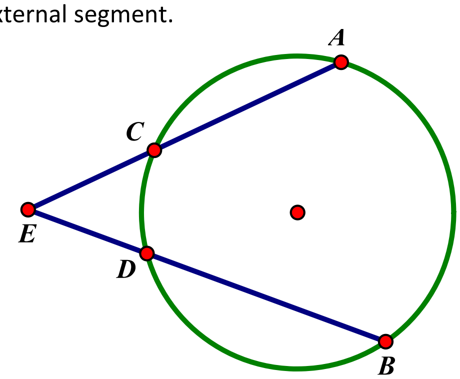
Given: $\overline{AC}$ and $\overline{BD}$ intersect at E.

Prove: $AE \cdot ED = CE \cdot EB$



Statement	Reason
1) $\angle AEB \cong \angle CED$	1) vertical ∠'s theorem
2) $\angle ABC \cong \angle ADC$	2) Inscribed ∠s are ≅ if they share arc.
3) $\triangle ABE \sim \triangle CDE$	3) AA Similarity
4) $\dfrac{AE}{EB} = \dfrac{CE}{ED}$	4) Def'n of similar △s
5) $AE \cdot ED = CE \cdot EB$	5) mult prop = R

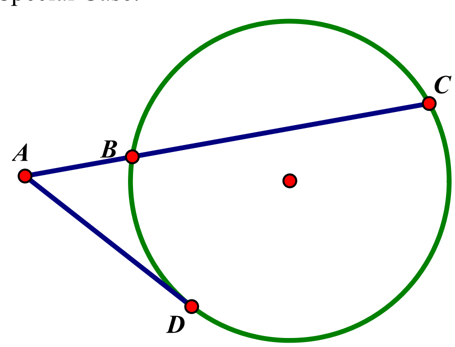
Theorem: If two secant segments share the same endpoint in the exterior of a circle, then the product of one secant and its external segment is equal to the product of the other secant and its external segment.



$EC \cdot EA = ED \cdot EB$

(out)(whole) = (out)(whole)

Special Case:



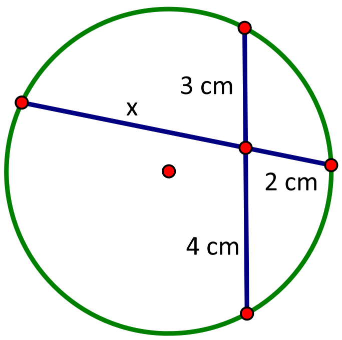
$AB \cdot AC = AD \cdot AD$

(out)(whole) = (out)(whole)

G.C.A.2 | Notes Section 13.5 | Name________________

Find the value of x.

#1)

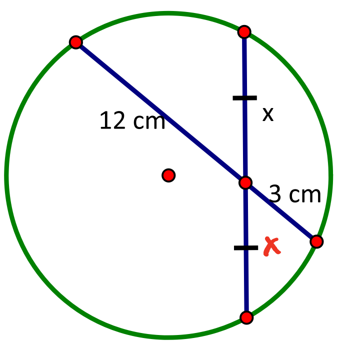


$2x = 3 \cdot 4$

$2x = 12$

$x = 4\text{cm}$

#2)



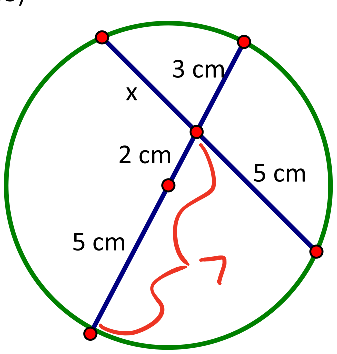
$x \cdot x = 12 \cdot 3$

$x^2 = 36$

$x = \pm 6$

$x = 6\text{ cm}$

#3)

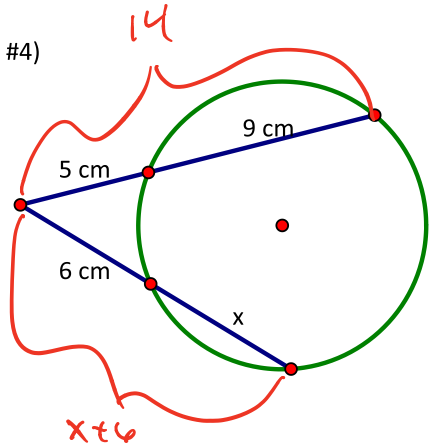


$5x = 3 \cdot 7$

$5x = 21$

$x = 21/5\text{ cm}$

#4)



$5 \cdot 14 = 6(x+6)$

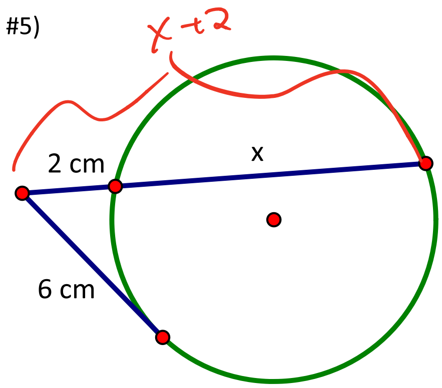
$70 = 6x + 36$

$34 = 6x$

$\frac{34}{6} = x$

$x = \frac{17}{3}\text{ cm}$

#5)



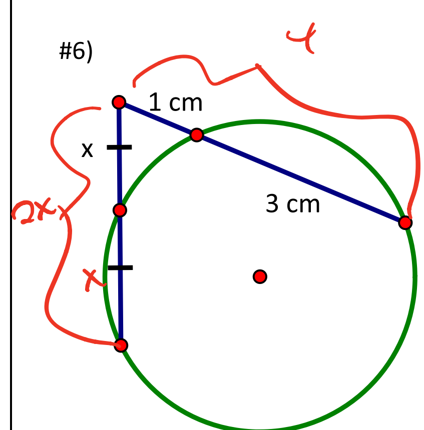
$2(x+2) = 6(6)$

$2x + 4 = 36$

$2x = 32$

$x = 16\text{ cm}$

#6)



$x(2x) = 1(4)$

$2x^2 = 4$

$x^2 = 2$

$x = \pm\sqrt{2}$

$x = \sqrt{2}\text{ cm}$