Lesson 8-6

Segment Formulas

HCPS
Henrico County Public Schools

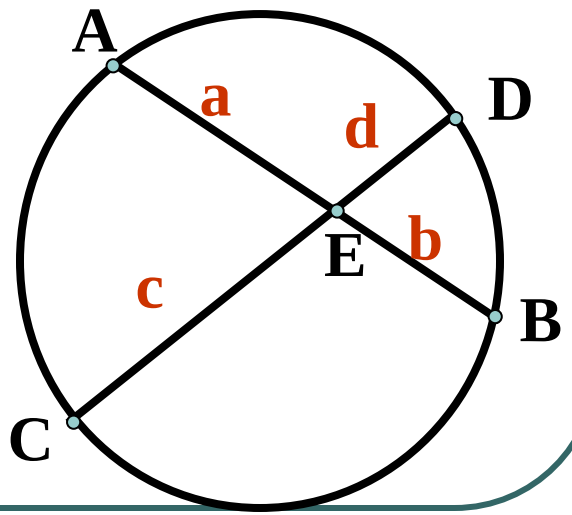
Intersecting Chords Theorem

Interior segments are formed by two intersecting chords.

Theorem:

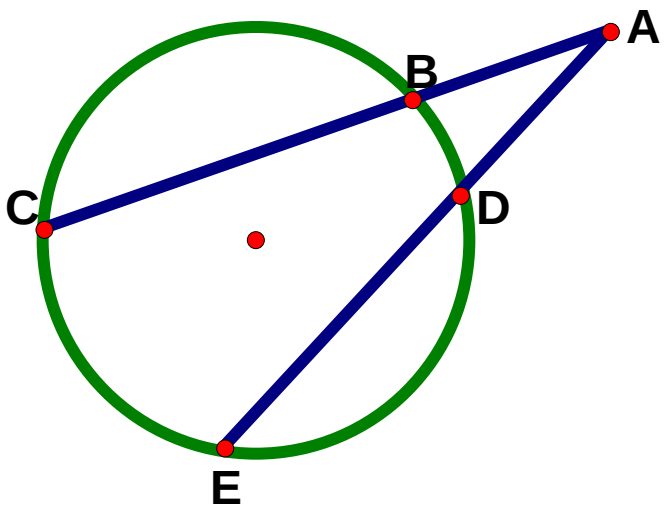
If two chords intersect within a circle, then the product of the lengths of the parts of one chord is equal to the product of the lengths of the parts of the second chord.

$$a \cdot b = c \cdot d$$

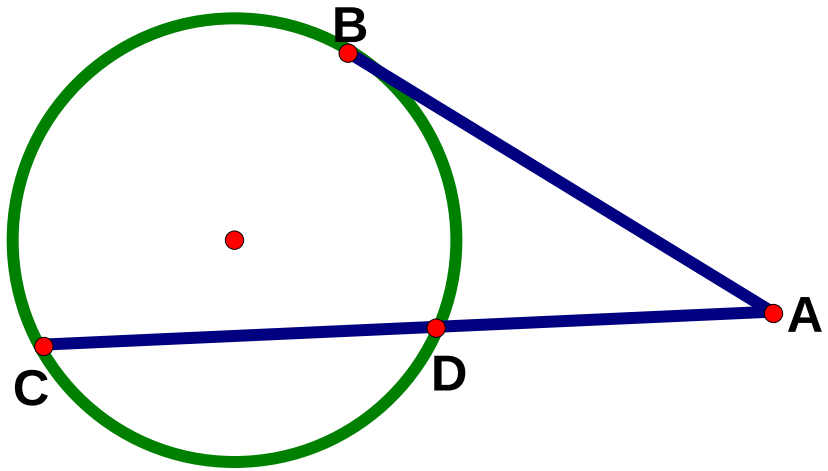


Intersecting Secants/Tangents

Exterior segments are formed by two secants, or a secant and a tangent.



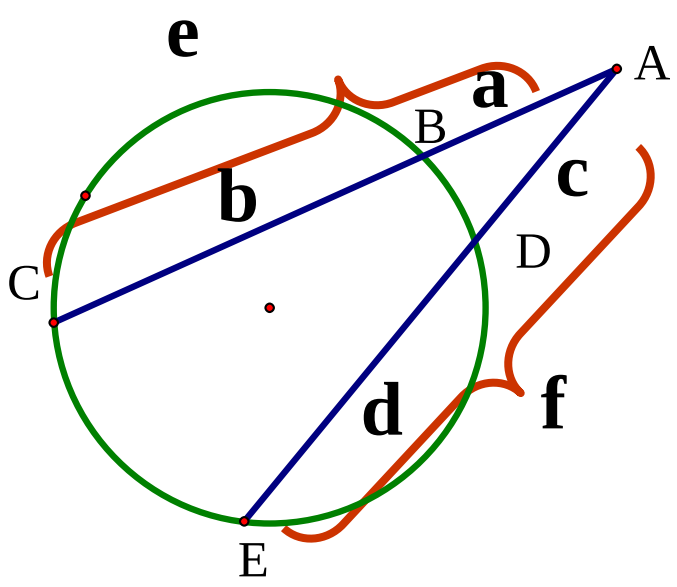
Two Secants



Secant and a Tangent

Intersecting Secants Theorem

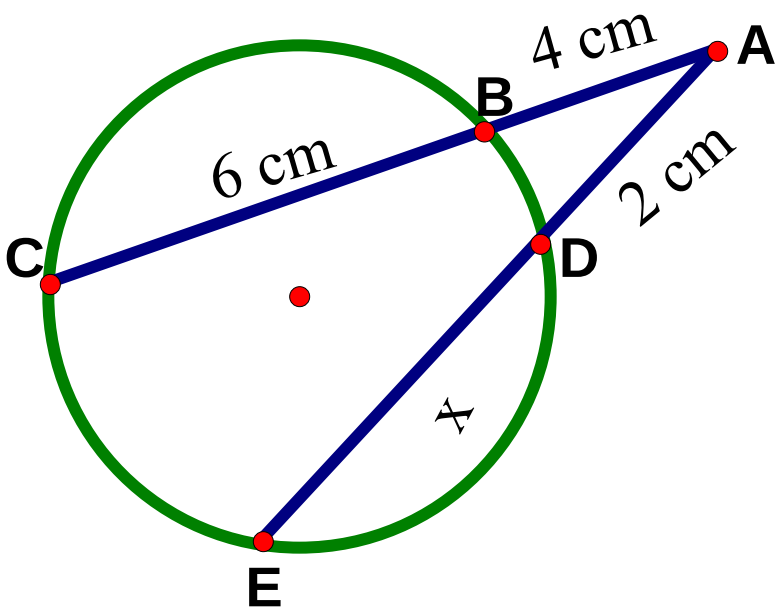
If two secant segments are drawn to a circle from an external point, then the products of the lengths of the secant and their exterior parts are equal.



$$a \cdot e = c \cdot f$$

Example:

In the figure; if $\overline{BC} = 6cm$, $\overline{AD} = 2cm$, $\overline{AB} = 4cm$. *Find* x.



AB ● AC = AD ● AE

4 ● 10 = 2 ● (2+x)

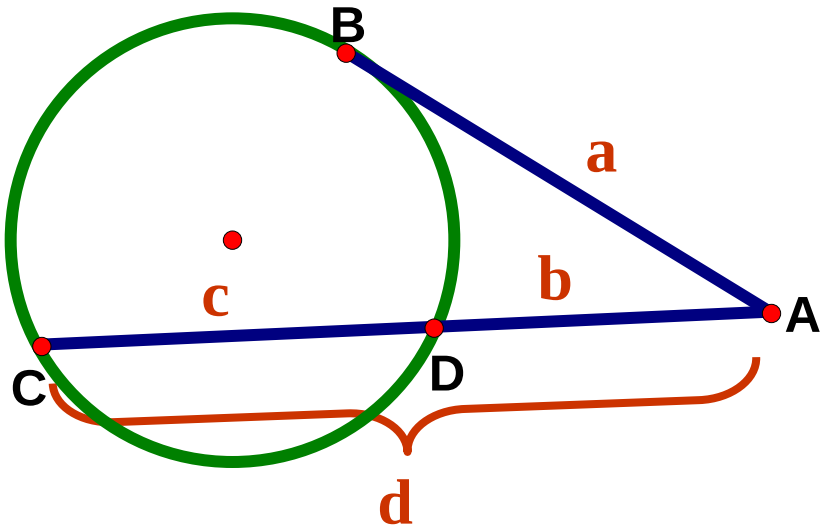
40 = 4 + 2x

36 = 2x

X = 18 cm

Secant and Tangent Theorem:

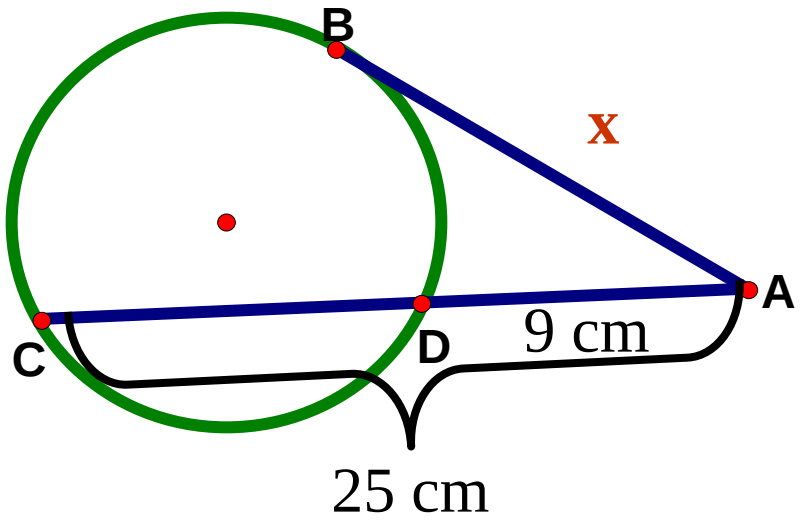
The square of the length of the tangent equals the product of the length of the secant and its exterior segment.



$$a^2 = b \cdot d$$

Example:

In the figure if $\overline{AD} = 9\,cm$, *and* $\overline{AC} = 25\,cm$. *Find* x.



$$AB^2 = AD \bullet AC$$

$$x^2 = 9 \bullet 25$$

$$x = \sqrt{225} = 15\ cm$$