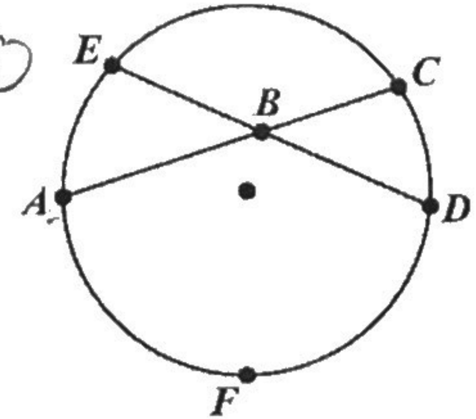
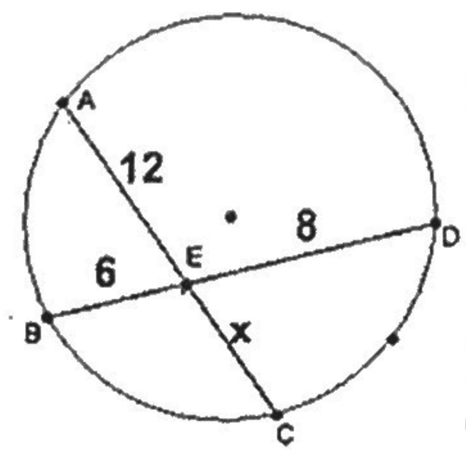
Segment Lengths (In and Out of a Circle)

Name	Theorem	Hypothesis	Conclusion
Segment Chord Theorem	If two chords in a circle ~~interest~~ intersect, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the second chord.		**POP = POP** **Product of Pieces = Product of Pieces** $(EB)(BD) = (AB)(BC)$

Example: Find x.



$12(x) = 6(8)$

$12x = 48$

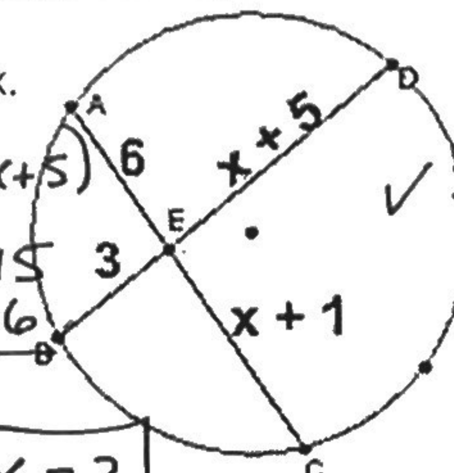
$\frac{12x}{12} = \frac{48}{12}$

$x = 4$

✓: $12(4) = 6(8)$

$48 = 48$

Example: Find x.



$6(x+1) = 3(x+5)$

$6x + 6 = 3x + 15$

$-3x \quad\quad -6$

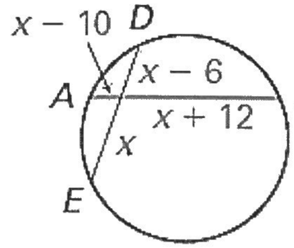
$\frac{3x}{3} = \frac{9}{3}$

$x = 3$

✓: $6(4) = 3(8)$

$24 = 24$

Example: Find x.



$\checkmark\ (5)(27) = 15(9) = 135\ \checkmark$

$(x-10)(x+12) = x(x+6)$

$x^2 + 2x - 120 = x^2 - 6x$

$-x^2 \qquad -x^2$

$2x - 120 = -6x$

$-2x \qquad -2x$

$\frac{-120}{-8} = \frac{-8x}{-8}$

$\boxed{x = 15}$

	x	−10
x	x^2	−10x
+12	12x	−120

$x^2 + 2x - 120$

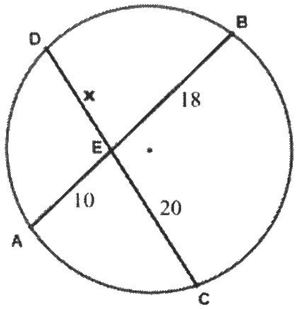
Try:

1. Find the value of x.

$(x)(20) = 10(18)$

$20x = 180$

$\boxed{x = 9}$



2. Find the value of x.

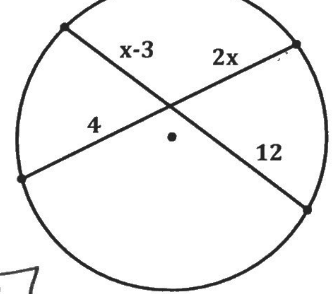
$12(x-3) = 4(2x)$

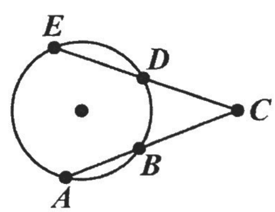
$12x - 36 = 8x$

$-12x \qquad -12x$

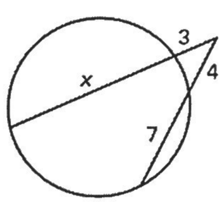
$\frac{-36}{-4} = \frac{-4x}{-4}$

$\boxed{x = 9}$

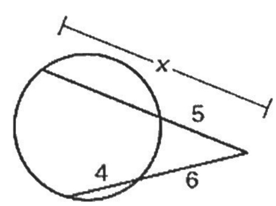


Secant Segment Theorem	If two secant segments intersect in the exterior of a circle, then the product of the lengths of the secant segment and its external secant segment is equal to the product of the lengths of the second secant segment and its external secant segment.		**OW = OW** **Outside * Whole = Outside * Whole**

Example: Find x.



Example: Find x.



Example: Find x and then JF.