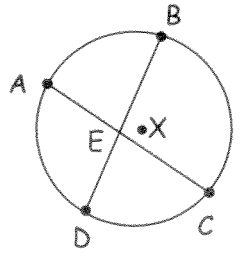
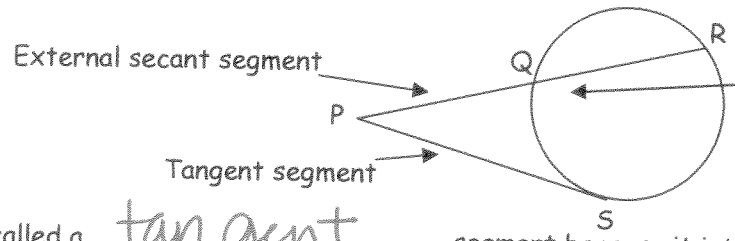
10-7 Special Segments in a Circle

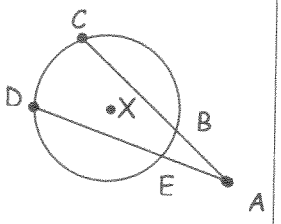
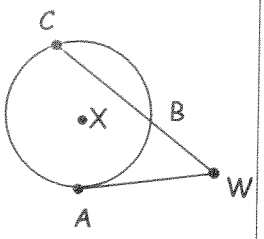
DIAGRAM	THEOREMS AND TERMINOLOGY	EXAMPLE
	**Chord Segment:** when 2 chords intersect inside a circle, it divides the chord into two segments. If 2 chords intersect in a circle, then the product of the lengths of the chord segments are =.	$\overline{AE}$ is a chord segment Given: ⊙X with chords $\overline{AC}$ and $\overline{BD}$ $AE \cdot EC = BE \cdot ED$



$\overline{PR}$ is the secant segment

$\overline{QR}$ is the chord

- $\overline{PS}$ is called a tangent segment because it intersects the circle in 1 point.
- $\overline{PR}$ is a secant segment.
- $\overline{PQ}$ is the external secant segment of $\overline{PR}$.

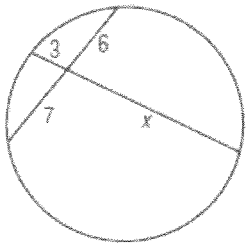
	If 2 secants intersect in the exterior of a circle, then the product of the measures of one secant segment and its external secant segment is equal to the product of the measures of the other secant segment and its external secant segment.	Given: ⊙X with secant segments $\overline{AC}$ and $\overline{AD}$ $AB \cdot AC = AE \cdot AD$
	If a tangent segment and a secant intersect in the exterior of a circle, then the square of the measure of the tangent segment is equal to the product of the measures of the secant segment and its external secant segment.	Given: ⊙X with secant segment $\overline{WC}$ and tangent $\overline{AW}$ $AW^2 = WB \cdot WC$

SUMMARY: Segment Lengths in Circles

1. 2 Chords: part times part = part times part
2. 2 Secant Segments: part times whole = part times whole
3. 1 Tangent & 1 Secant: tangent squared = part times whole

Find x to the nearest tenth. Assume that segments that appear to be tangent are tangent.

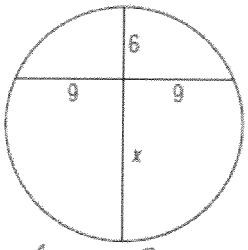
1.



$3x = 42$

$\boxed{x = 14}$

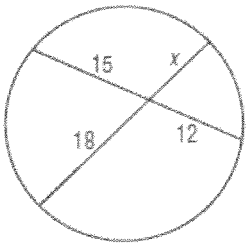
2.



$6x = 81$

$\boxed{x = 13.5}$

3.

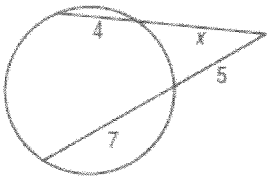


$18x = 15(12)$

$18x = 180$

$\boxed{x = 10}$

4.



$x(x+4) = 5(12)$

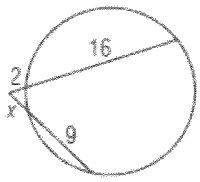
$x^2 + 4x = 60$

$x^2 + 4x - 60 = 0$

$(x+10)(x-6) = 0$

$\boxed{x = 6}$

5.



$x(x+9) = 2(18)$

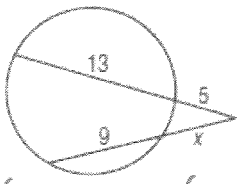
$x^2 + 9x = 36$

$x^2 + 9x - 36 = 0$

$(x+12)(x-3)$

$\boxed{x = 3}$

6.



$\boxed{x = 6}$

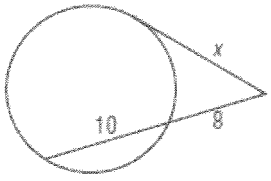
$x(x+9) = 5(18)$

$x^2 + 9x = 90$

$x^2 + 9x - 90 = 0$

$(x+15)(x-6)$

7.

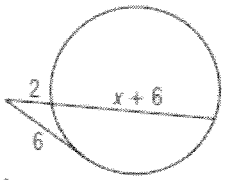


$x^2 = 8(18)$

$x^2 = 144$

$\boxed{x = 12}$

8.



$2 + x + 6$

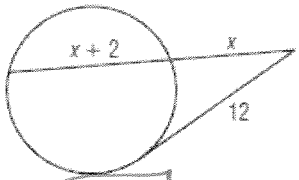
$\boxed{x = 10}$

$36 = 2(x+8)$

$36 = 2x + 16$

$20 = 2x$

9.



$\boxed{x = 8}$

$x(2x+2) = 144$

$2x^2 + 2x = 144$

$2x^2 + 2x - 144 = 0$

$2(x^2 + x - 72) = 0$

$2(x+9)(x-8)$

10. CONSTRUCTION An arch over an apartment entrance is 3 feet high and 9 feet wide. Find the radius of the circle containing the arc of the arch.

$3x = 4.5(4.5)$

$\boxed{x = 6.75 \text{ ft}}$