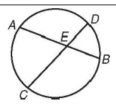
Geometry Notes Section 12-6 April 29

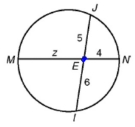
Segment Relationships in Circles

Chord-Chord Product Theorem	
If two chords intersect in the interior of a circle, then the products of the lengths of the segments of the chords are equal. $AE \cdot EB = CE \cdot ED$	

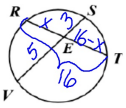
1. $z =$ 7.5

$z \cdot 4 = 5 \cdot 6$

$4z = 30$



2. $RT = 16, EV = 5, SE = 3.$ $RE =$ 15 or 1



$x(16-x) = 15$

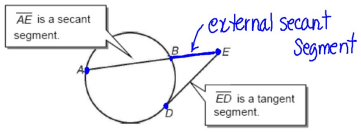
$16x - x^2 = 15$

$0 = x^2 - 16x + 15$

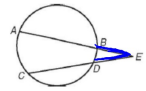
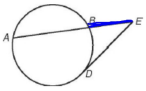
$0 = (x-15)(x-1)$

$x = 15$ or 1

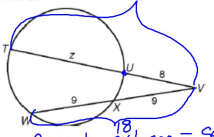
- A **secant segment** is a segment of a secant with at least one endpoint on the circle.
- An **external secant segment** is the part of the secant segment that lies in the exterior of the circle.
- A **tangent segment** is a segment of a tangent with one endpoint on the circle.



If two segments intersect outside a circle, the following theorems are true.

Secant-Secant Product Theorem The product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segment and its external segment. secant · external segment = secant · external segment $AE \cdot BE = CE \cdot DE$	
Secant-Tangent Product Theorem The product of the lengths of the secant segment and its external segment equals the length of the tangent segment squared. secant · external segment = tangent^2 $AE \cdot BE = DE^2$	

3. Find z.



$z+8$

Secant · ext. seg. = secant · ext. seg.

$(z+8) \cdot 8 = 18 \cdot 9$

$8z + 64 = 162$

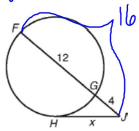
$8z = 98$

$z = 12\frac{1}{4}$

12.25

$\frac{49}{4}$

4. Find x. = 8



16

Secant · ext seg = tangent^2

$16 \cdot 4 = x^2$

$64 = x^2$

$\pm 8 = x$