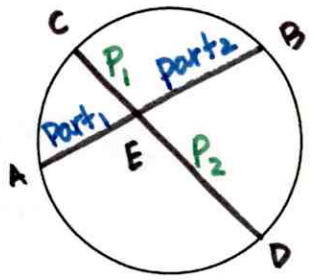
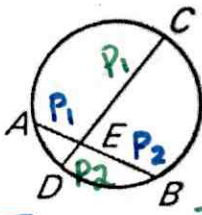
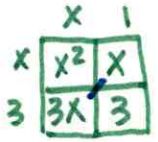
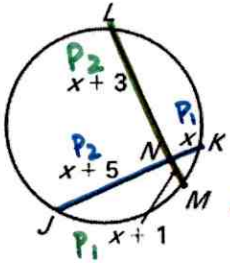
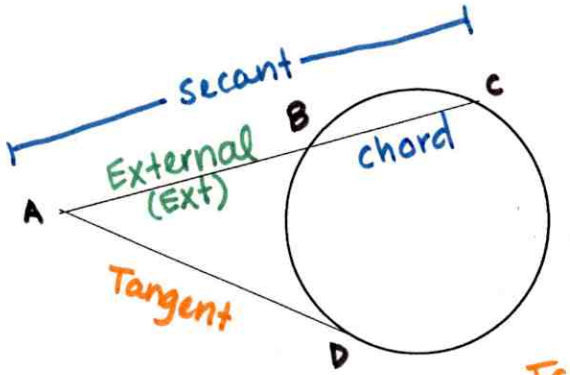
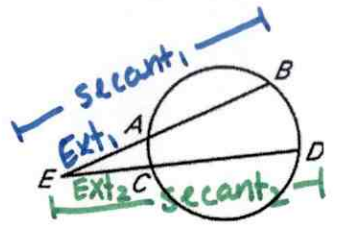
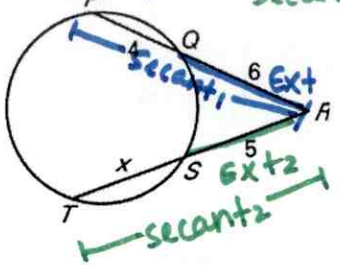
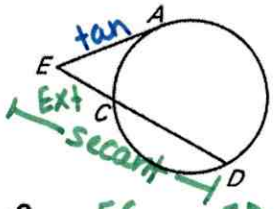
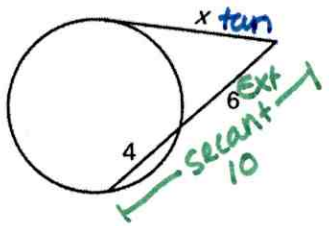
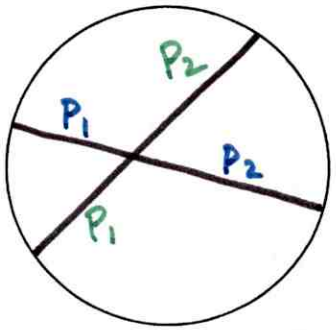
Section 10.6 Date _____

Find Segment Lengths in Circles

Vocabulary	Definition	Example
SEGMENTS of a CHORD	When two chords intersect in the interior of a circle, each chord is divided into two segments that are called segments of the chord.	 chord$_1$ = $\overline{AB}$ $P_1 = \overline{AE}$ $P_2 = \overline{EB}$ chord$_2$ = $\overline{CD}$ $P_1 = \overline{CE}$ $P_2 = \overline{ED}$
THEOREM 10.14 SEGMENTS of CHORDS THEOREM 2 chords	If two chords intersect in the interior of a circle, 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 other chord.	 $\overline{AB}$ $\overline{CD}$ $EA \cdot EB = EC \cdot ED$ $P_1(P_2) = P_1(P_2)$  **Find *ML* and *JK*.** $\overline{JK}$ $P_1 = x$ $P_2 = x+5$ $\overline{LM}$ $P_1 = x+1$ $P_2 = x+3$  $P_1(P_2) = P_1(P_2)$ $x(x+5) = (x+1)(x+3)$ $x^2 + 5x = x^2 + 4x + 3$ $-4x \quad -4x$ $x = 3$ $JK = 3+5+3$ $JK = 11$ $ML = 3+3+3+1$ $ML = 10$
SECANT SEGMENT	A secant segment is a segment that contains a chord of a circle, and has exactly one endpoint outside the circle.	 Secant Segment = $\overline{AC}$ chord = $\overline{BC}$ External segment = $\overline{AB}$ AC = AB + BC secant = Ext + chord Tangent segment = $\overline{AD}$
EXTERNAL SEGMENT	An external segment is the part of a secant segment that is outside the circle.	

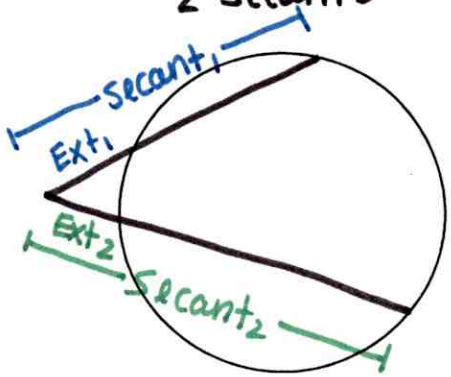
THEOREM 10.15 SEGMENTS of SECANTS THEOREM 2 Secants	If two secant segments share the same endpoint outside the circle, then the product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segments and its external segment.	 $EA \cdot EB = EC \cdot ED$ $Ext_1(Secant_1) = Ext_2(Secant_2)$ $Secant_1 = Ext_1 + Chord_1$ $EB = EA + AB$ $\quad ED = EC + CD$	$Ext_1 = 6$ $\quad Ext_2 = 5$ $Secant_1 = 10$ $\quad Secant_2 = x+5$  $6(10) = 5(x+5)$ $60 = 5x + 25$ $35 = 5x$ $x = 7$
THEOREM 10.15 SEGMENTS of SECANTS and TANGENTS THEOREM Secant and Tangent	If a secant segment and a tangent segment share an endpoint outside a circle, then the product of the lengths of a secant segment and its external segment equals the square of the length of the tangent segment.	 $EA^2 = EC \cdot ED$ $(tan)^2 = Ext(Secant)$	$tan = x$ $\quad Ext = 6$ $Secant = 10$  $x^2 = 6(10)$ $\sqrt{x^2} = \sqrt{60}$ $2 \cdot 30$ $2 \cdot 15$ $3 \cdot 5$ $x = 2\sqrt{15}$

2 chords



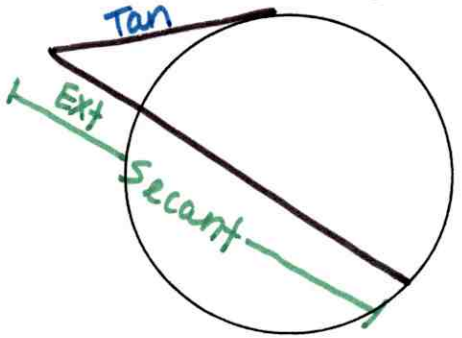
$P_1(P_2) = P_1(P_2)$

2 secants



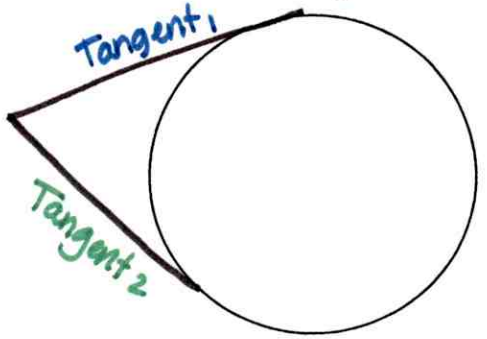
$Ext_1(Secant_1) = Ext_2(secant_2)$

secant and Tangent



$(tan)^2 = Ext(secant)$

2 Tangents



$Tangent_1 = Tangent_2$