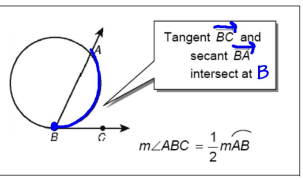
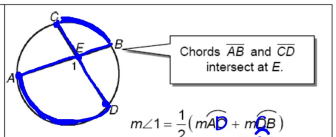
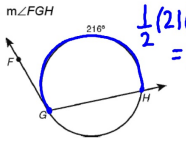
Geometry Notes Section 12-5 April 28

Angle Relationships in Circles

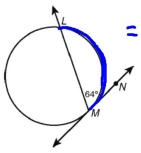
If a tangent and a secant (or chord) intersect on a circle at the point of tangency, then the measure of the angle formed is half the measure of its intercepted arc. $m\overset{\frown}{AB} = 2\,m\angle ABC$	 $m\angle ABC = \frac{1}{2}m\overset{\frown}{AB}$
If two secants or chords intersect in the interior of a circle, then the measure of the angle formed is half the sum of the measures of its intercepted arcs.	 $m\angle 1 = \frac{1}{2}(m\overset{\frown}{AD} + m\overset{\frown}{CB})$

Find each measure.

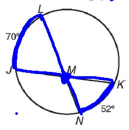
1. $m\angle FGH$ $\frac{1}{2}(216^\circ) = 108^\circ$



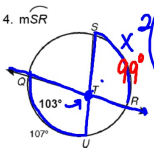
2. $m\overset{\frown}{LM}$ $= 2 \cdot 64^\circ$ 128°



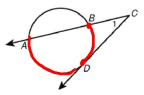
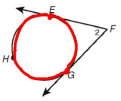
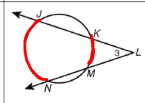
3. $m\angle JML$ $\frac{1}{2}(70+52)$ 61°



4. $m\overset{\frown}{SR}$ $2(103) = \frac{1}{2}(107+x)$ 99° $206 = 107 + x$



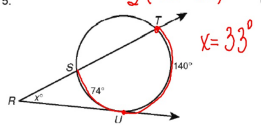
If two rays or segments intersect in the exterior of a circle, then the measure of the angle formed is half the difference of the measures of its intercepted arcs.

A Tangent and a Secant	Two Tangents	Two Secants
 $m\angle 1 = \frac{1}{2}(m\overset{\frown}{AD} - m\overset{\frown}{BD})$	 $m\angle 2 = \frac{1}{2}(m\overset{\frown}{EHG} - m\overset{\frown}{EG})$	 $m\angle 3 = \frac{1}{2}(m\overset{\frown}{JN} - m\overset{\frown}{KM})$

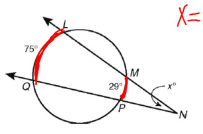
vertex outside ⊙

Find the value of x.

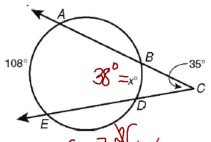
5. $\frac{1}{2}(140-74)$ $x = 33^\circ$



6. $x = \frac{1}{2}(75-29)$ 23°



7.

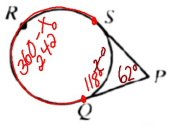


$2[35] = \frac{1}{2}(108-x)$

$70 = 108 - x$

$x = 38$

8. $m\angle P = 62^\circ$; find $m\overset{\frown}{SQ}$. $= 118^\circ$



$62 = \frac{1}{2}(360-x-x)$

$62 = \frac{1}{2}(360-2x)$

$62 = 180 - x$