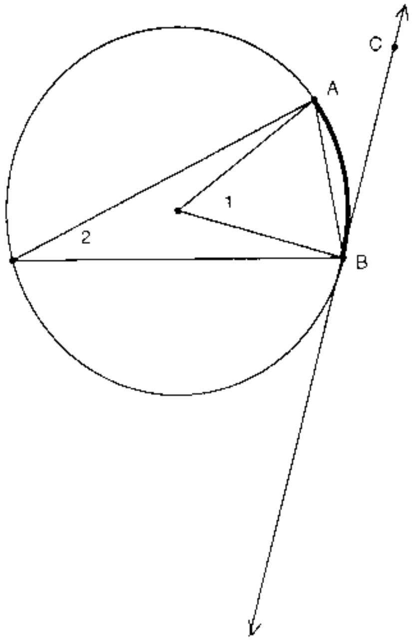
Summary of angle and arc relations on a circle



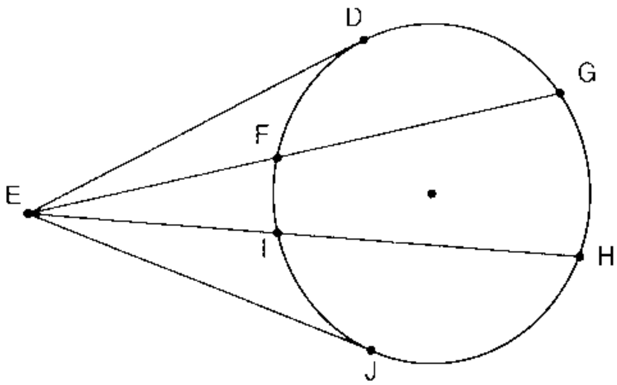
Vertex on the center, sides are radii – angle measure equals measure of intercepted arc

$m\angle 1 = m\widehat{AB}$

Vertex on the circle, sides are chords or a chord and a tangent – angle measure equals half the measure of the intercepted arc

$m\angle 2 = \frac{1}{2} m\widehat{AB}$

$m\angle ABC = \frac{1}{2} m\widehat{AB}$

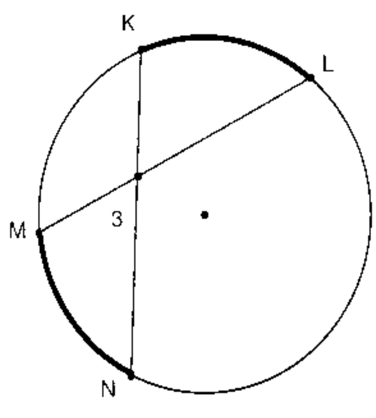


Vertex outside circle, sides formed by two secants or secant and tangent or two tangents – angle measure is half the difference of the intercepted arcs

$m\angle GEH = \frac{1}{2} (m\widehat{GH} - m\widehat{FI})$

$m\angle DEG = \frac{1}{2} (m\widehat{DG} - m\widehat{DF})$

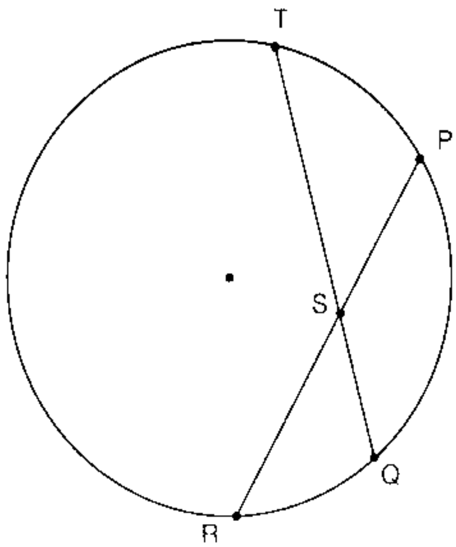
$m\angle DEJ = \frac{1}{2} (m\widehat{DGJ} - m\widehat{DFJ})$



Vertex inside the circle, sides are intersecting chords – angle measure is half the sum of the measures of the intercepted arc and the arc intercepted by its vertical angle

$m\angle 3 = \frac{1}{2} (m\widehat{MN} + m\widehat{KL})$

Summary of Segment Relations on a Circle



Think of the two segments that you will be multiplying as the segment starting with the point of intersection and ending with a point on the circle. If there is only one point of intersection use the segment twice.

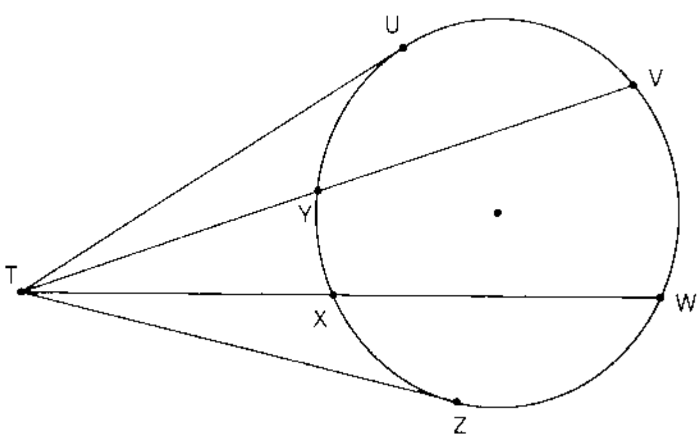
Intersection inside circle, (two intersecting chords)

$ST \cdot SQ = SP \cdot SR$

Intersection outside circle, (two secants or secant and tangent)

$TX \cdot TW = TY \cdot TV$

$TX \cdot TW = TU \cdot TU = TU^2$



For two tangent segments there is no need to do a product. Tangent segments from the same point are equal.

$TU = TZ$