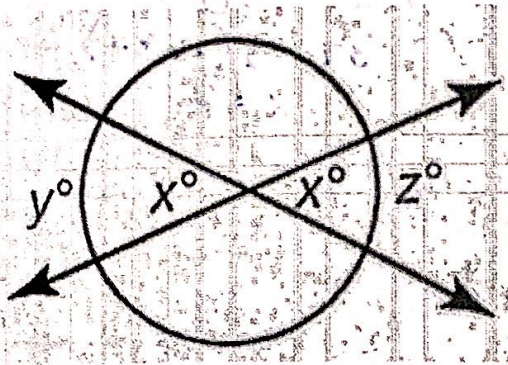


Angles Formed by Intersecting Lines

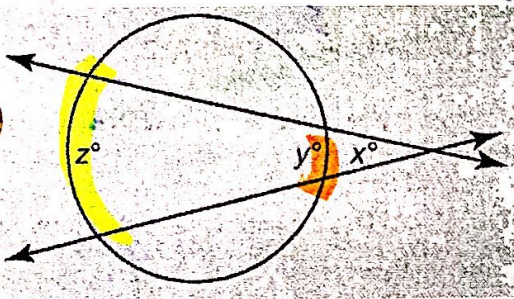
When Two Lines Intersect INSIDE a Circle: When lines or line segments intersect inside a circle, the measure of the vertical angles formed is equal to half the sum of the measures of the intercepted arcs.



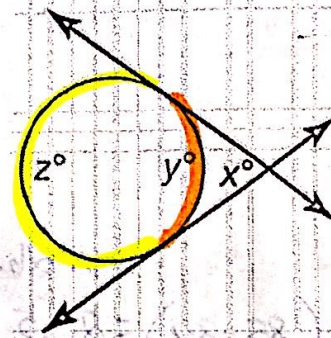
$$x^\circ = \frac{1}{2}(z^\circ + y^\circ)$$

When Two Lines Intersect OUTSIDE of a Circle: When lines intersect outside a circle, the measure of the angle at which they intersect is equal to half the difference of the measures of the intercepted arcs.

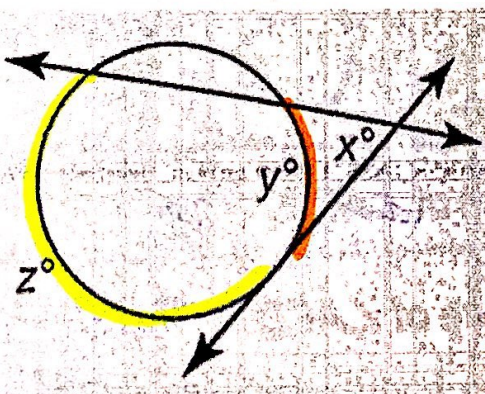
Two Secant Lines



Two Tangent Lines



A Secant and a Tangent Line

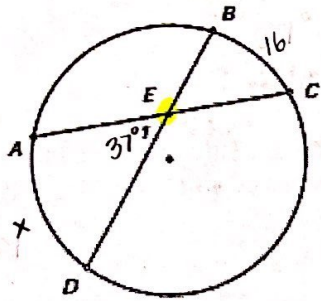


$$x^\circ = \frac{1}{2}(z^\circ - y^\circ)$$

↑ Big ↑ Little

$$X = \frac{1}{2}(z + y)$$

$$\angle 1 = \frac{1}{2}(64 + 37) = 50.5^\circ$$

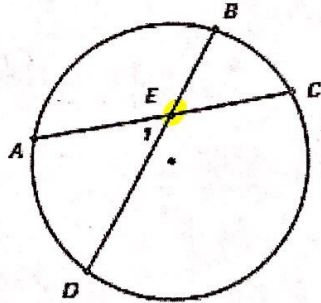


$$\widehat{BC} = 37^\circ, \widehat{AD} = 64^\circ, \angle 1 = 50.5^\circ$$

$$\angle 1 = 37^\circ, \widehat{BC} = 16^\circ, \widehat{AD} = 58^\circ$$

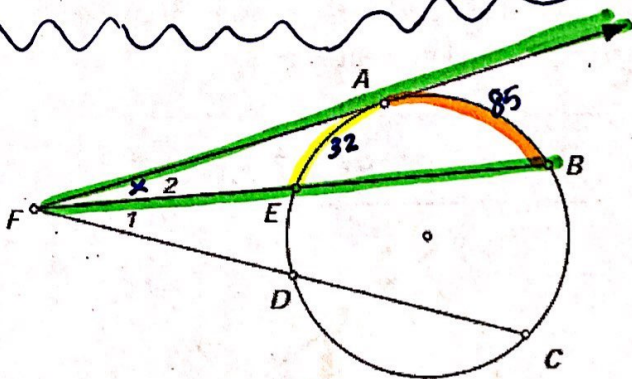
$$37 = \frac{1}{2}(16 + x)$$

$$x = 58^\circ$$



$$\widehat{BC} = 24^\circ, \widehat{AD} = 52^\circ, \angle 1 = \underline{\hspace{2cm}}$$

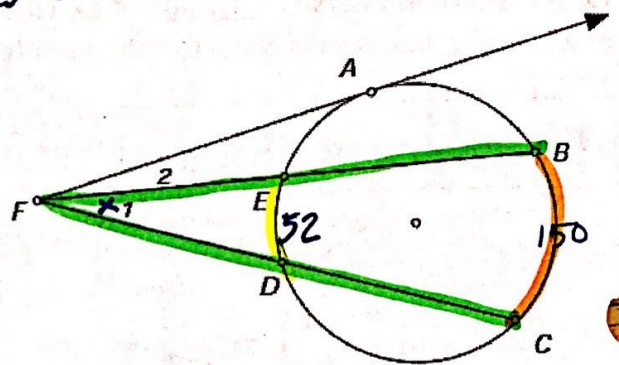
$$\angle 1 = 42^\circ, \widehat{AD} = 67^\circ, \widehat{BC} = \underline{\hspace{2cm}}$$



$$\widehat{AB} = 85^\circ, \widehat{AE} = 32^\circ, \angle 2 = 26.5^\circ$$

$$x = \frac{1}{2}(85 - 32) = 26.5$$

$$\angle 1 = 42^\circ, \widehat{ED} = 67^\circ, \widehat{BC} = \underline{\hspace{2cm}}$$

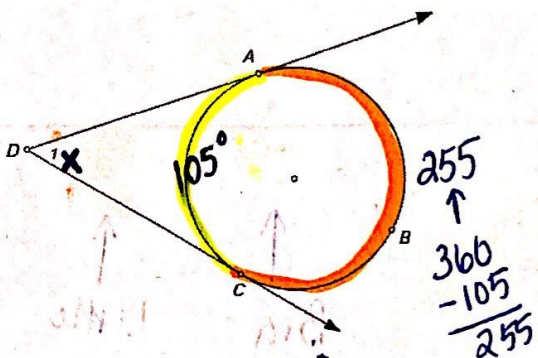


$$\widehat{BC} = 150^\circ, \widehat{ED} = 52^\circ, \angle 1 = 49^\circ$$

$$x = \frac{1}{2}(150 - 52) = 49^\circ$$

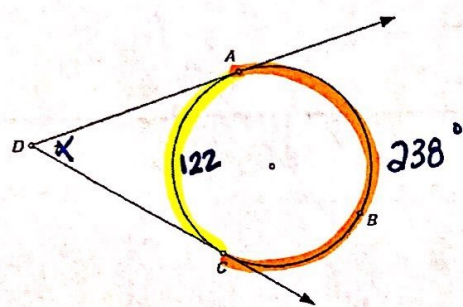
$$\angle 2 = 15^\circ, \widehat{AB} = 58^\circ, \widehat{AE} = \underline{\hspace{2cm}}$$

$$x = \frac{1}{2}(z - y)$$



$$\widehat{AC} = 105^\circ; \angle 1 = 75^\circ$$

$$x = \frac{1}{2}(255 - 105) = 75^\circ$$



$$\widehat{ABC} = 238^\circ; \angle 1 = 58^\circ$$

$$x^\circ = \frac{1}{2}(238 - 122) = 58^\circ$$