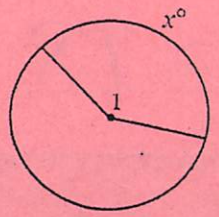
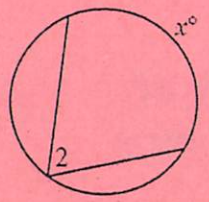
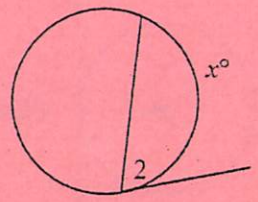
Important Circle Formulas



The vertex of the angle is located at the center of the circle. So, the angle is a **central angle** and is equal to the measure of the intercepted arc.

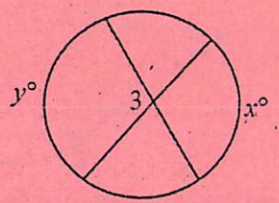
$m\angle 1 = x^\circ$





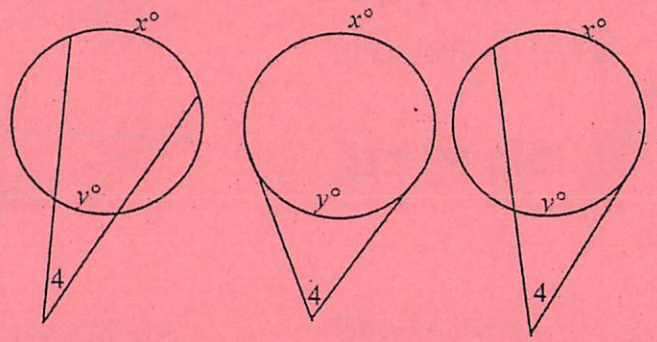
The vertex of the angle is a point on the circle. So, the measure of the angle is one half the measure of the intercepted arc.

$m\angle 2 = \frac{1}{2}\, x^\circ$



The vertex of the angle is located in the **interior** of the circle and not at the center, so the measure of the angle is half the **sum** of the intercepted arcs.

$m\angle 3 = \frac{1}{2}(x^\circ + y^\circ)$



The vertex of the angle is located in the **exterior** of the circle and not at the center, so the measure of the angle is half the **difference** of the intercepted arcs.

$m\angle 4 = \frac{1}{2}(x^\circ - y^\circ)$

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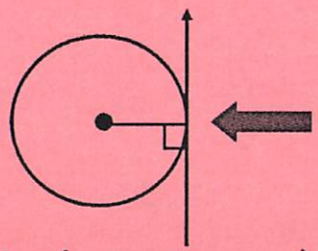
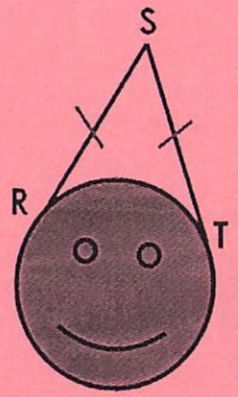


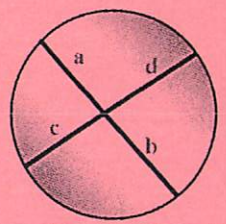
If a line (segment or ray) is tangent to a circle, then it is perpendicular to the radius drawn to the point of tangency.



$$RS \cong TS$$

If two segments from the same exterior point are tangent to a circle, then they are congruent.

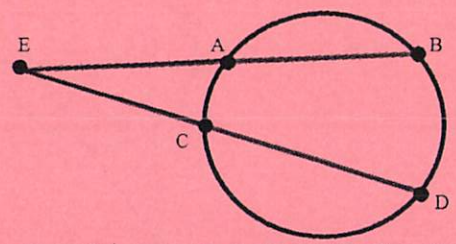
Type 1: Two chords intersect INSIDE the circle



ab = cd

part • part = part • part

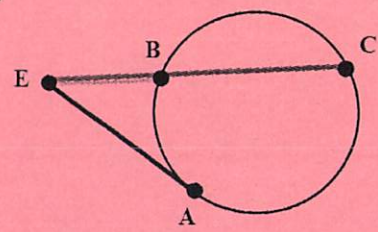
Type 2: Two secants intersect OUTSIDE the circle



outside • whole = outside • whole

EA • EB = EC • ED

Type 2 (with a twist): Secant and Tangent



outside • whole = outside • whole

$$EA^2 = EB \cdot EC$$