

Name:

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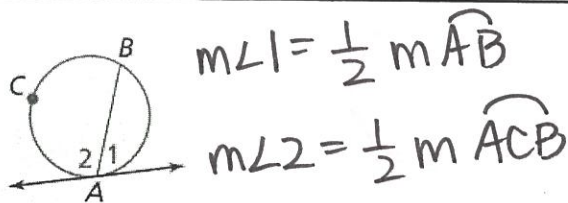
Period: |

Angle Relationships in Circles

Lesson Objective INBAT find angle + arc measures
+ use circumscribed $\angle$'s

Tangent and Intersected Chord Theorem

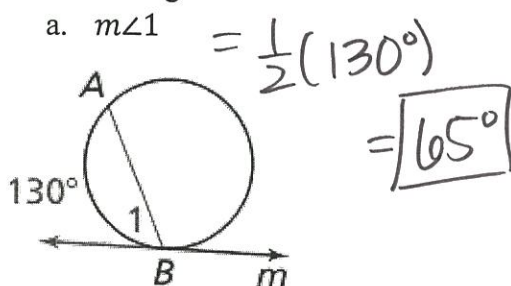
If a tangent and a chord intersect at a point on a circle, then the measure of each angle formed is $\frac{1}{2}$ the measure of its intercepted arc.



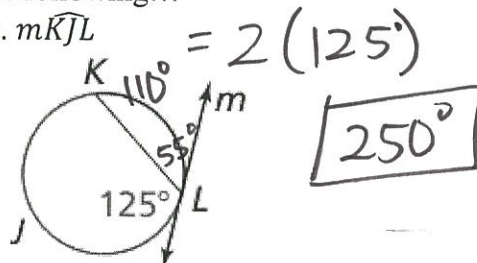
Example:

1. Line m is tangent to the circle. Find the measure of each of the following...

a. $m\angle 1$



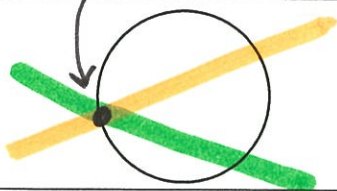
b. $m\widehat{KJL}$



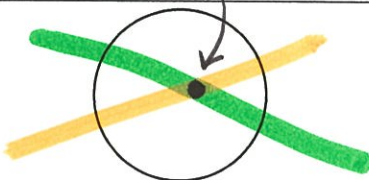
Intersecting Lines and Circles

If two nonparallel lines intersect a circle, there are three places where the lines can intersect

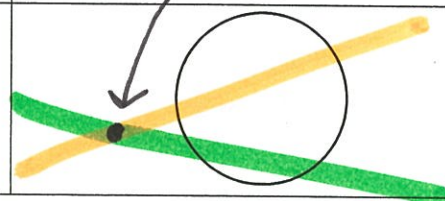
ON the circle



INSIDE the circle

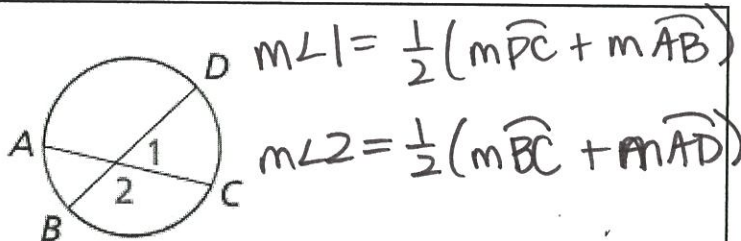


OUTSIDE the circle



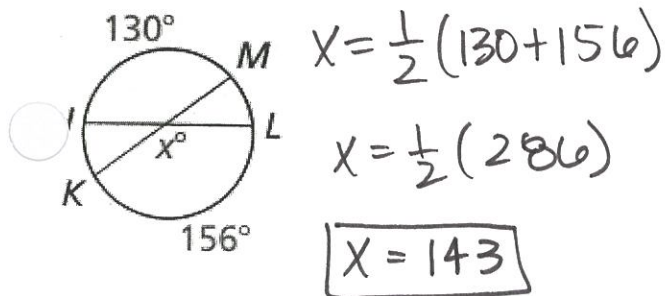
Angles Inside the Circle Theorem

If two chords intersect *inside* a circle, then the measure of each angle is $\frac{1}{2}$ the SUM of the measures of the arcs intercepted by the angle and its vertical angle.

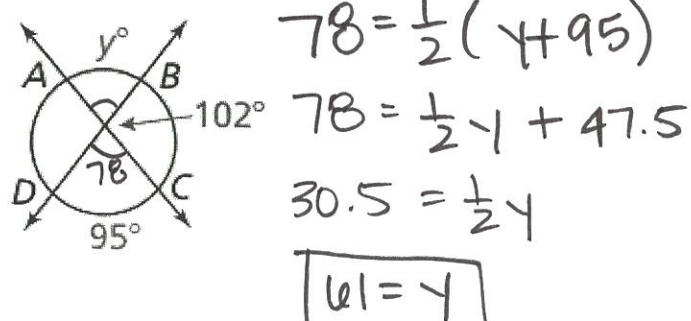


Examples:

2. Find the value of x .



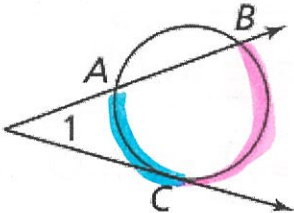
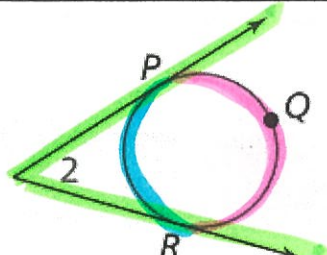
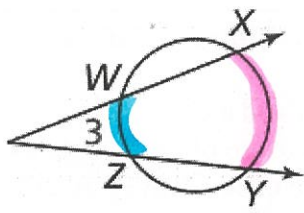
3. Find the value of y .



Angles Outside the Circle Theorem

$$\text{angle} = \frac{1}{2} (\text{outer arc} - \text{inner arc})$$

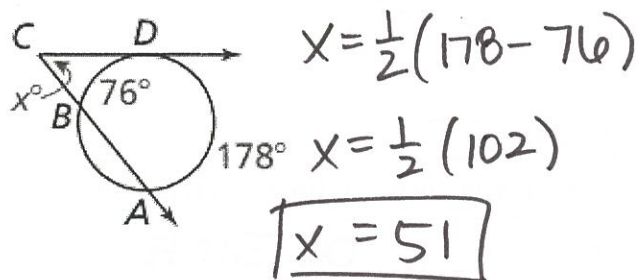
If a tangent and a secant, two tangents, or two secants intersect *outside* a circle, then the measure of the angle formed is $\frac{1}{2}$ the difference of the measures of the intercepted arcs.

Tangent and Secant	Two Tangents	Two Secants
		
$m\angle 1 = \frac{1}{2} (m\widehat{BC} - m\widehat{AC})$	$m\angle 2 = \frac{1}{2} (m\widehat{QR} - m\widehat{PR})$	$m\angle 3 = \frac{1}{2} (m\widehat{XY} - m\widehat{WZ})$

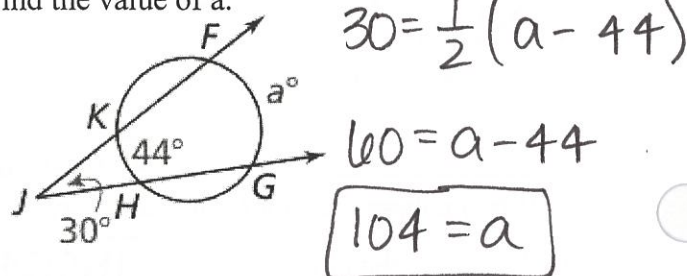
Circumscribed Angle: an angle whose sides are tangent to a circle

Examples:

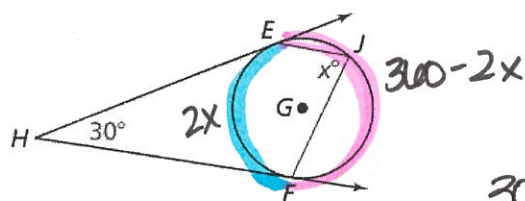
4. Find the value of x.



5. Find the value of a.



6. Find the value of x.



7. The northern lights are bright flashes of colored light between 50 and 200 miles above the earth. A flash occurs 150 miles above Earth at point C. What is the measure of $\widehat{BD}$, the portion of the Earth from which the flash is visible? (Earth's radius is approximately 4000 miles)

