Angles Formed by Secants and Tangents

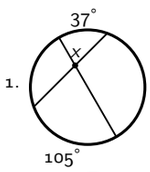
Intersecting Secants – Exterior Theorem: The measure of an angle formed by two secants that intersect in the exterior of a circle is one-half the difference of its intercepted arcs.

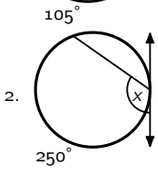
Tangent Point – Secant Theorem: The measure of an angle formed by a tangent and a secant drawn at the point of contact is one-half the measure of its intercepted arc.

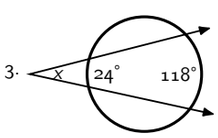
Intersecting Secants – Interior Theorem: The measure of an angle formed by two secants intersecting in the interior of the circle is equal to one-half the sum of the measures of its intercepted arcs.

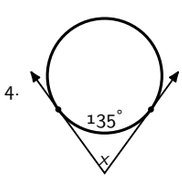
Practice Exercises

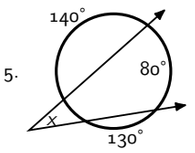
Find the value of x.

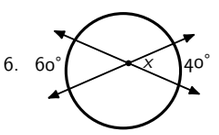
1. 

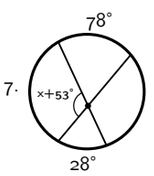
2. 

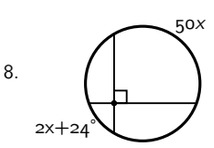
3. 

4. 

5. 

6. 

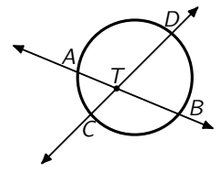
7. 

8. 

Problem Set

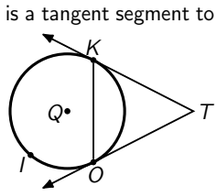
A. Use the figure to solve the following.

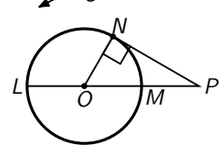
1. If $m\overset{\frown}{AC}$ 40° and $m\overset{\frown}{BD}$ 80°, find $m\angle ATC$.
2. If $m\angle BTC$ 142° and $m\overset{\frown}{AD}$ 156°, find $m\overset{\frown}{BC}$.
3. If $m\overset{\frown}{ADB}$ 208°, $m\overset{\frown}{AC}$ 52° and $m\overset{\frown}{DBC}$ 192°, find $m\angle ATD$.



B. Solve each problem completely.

1. The angle formed by two secants intersecting in the exterior of the circle measures 64°. One of the intercepted arcs is 208°. Find the other arc.
2. In $\odot Q$, the endpoints of chord $\overline{OK}$ are the points of tangency of lines $\overleftrightarrow{TO}$ and $\overleftrightarrow{TK}$. If ΔTOK is an equilateral triangle, find $m\overset{\frown}{OIK}$.
3. In $\odot O$, $\overline{LM}$ is a diameter of $\odot O$ where $\overline{OM}$ extends its own length to P. If $\overline{PN}$ is a tangent segment to $\odot O$ at N, find $m\angle P$.





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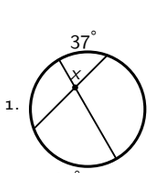
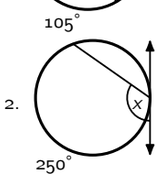
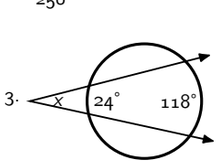
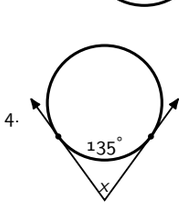
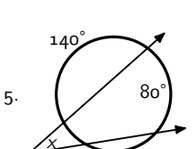
Find the value of x.

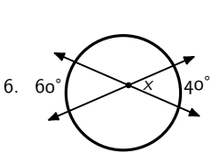
1. 

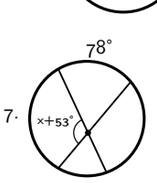
2. 

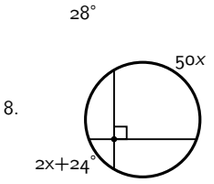
3. 

4. 

5. 

6. 

7. 

8. 

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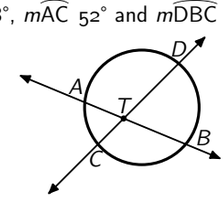

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