

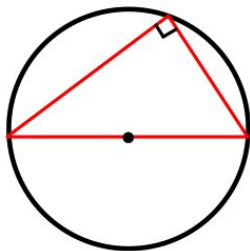


The Geometry Series

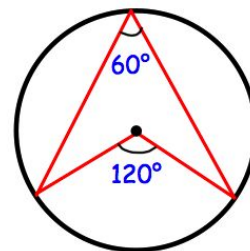
Circles

Math Club Junior

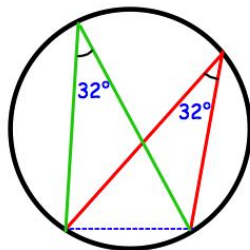
Basic Theorems



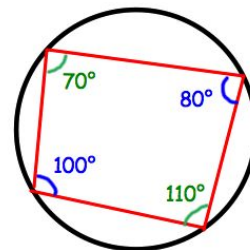
The angle in a semi-circle is 90°



The angle at the circumference is half the angle at the centre

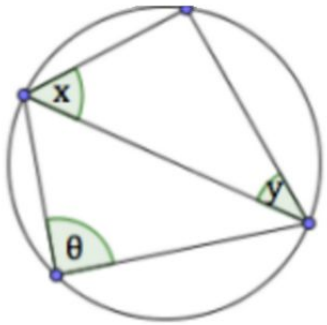


The angles in the same segment from a common chord are equal

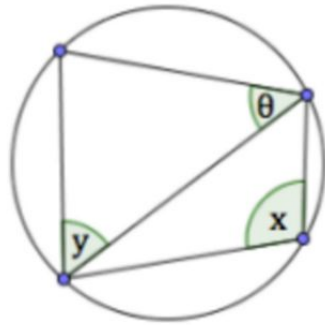


The opposite angles in a cyclic quadrilateral always add to 180°

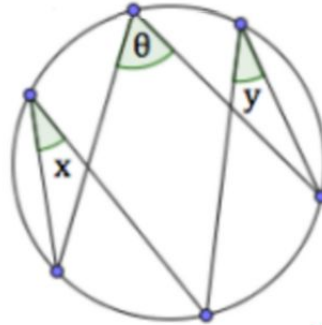
Practice



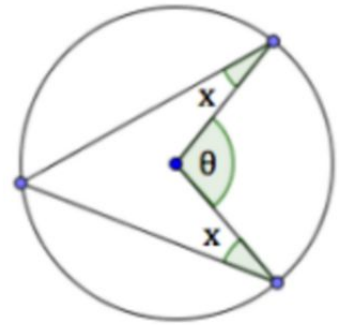
$$\begin{aligned}x &= 60^\circ \\y &= 40^\circ \\ \theta &= \end{aligned}$$



$$\begin{aligned}x &= 120^\circ \\y &= 70^\circ \\ \theta &= \end{aligned}$$

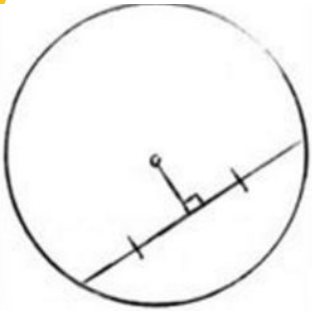


$$\begin{aligned}x &= 30^\circ \\y &= 40^\circ \\ \theta &= \end{aligned}$$

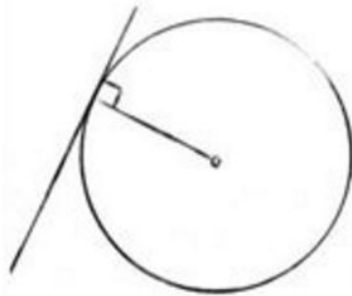


$$\begin{aligned}x &= 30^\circ \\ \theta &= \end{aligned}$$

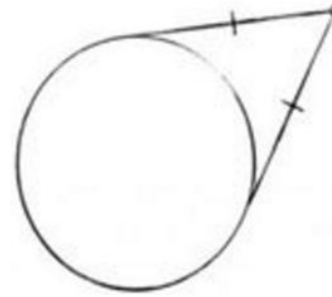
More Theorems



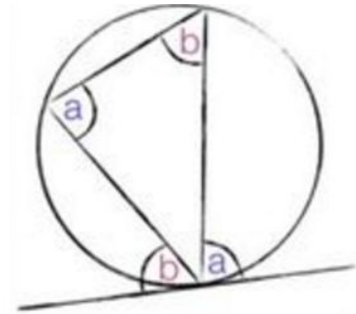
The perpendicular from the center to the chord bisects the chord



The angle between a tangent and a radius is 90°



Tangents from a point outside the circle are equal in length



Alternate segment theorem

Diagram **NOT** accurately drawn to scale.

A and B are points on the circumference of a circle, center O . PA and PB are tangents to the circle.

$\angle APB$ is 86° .

What's x .

More Practice

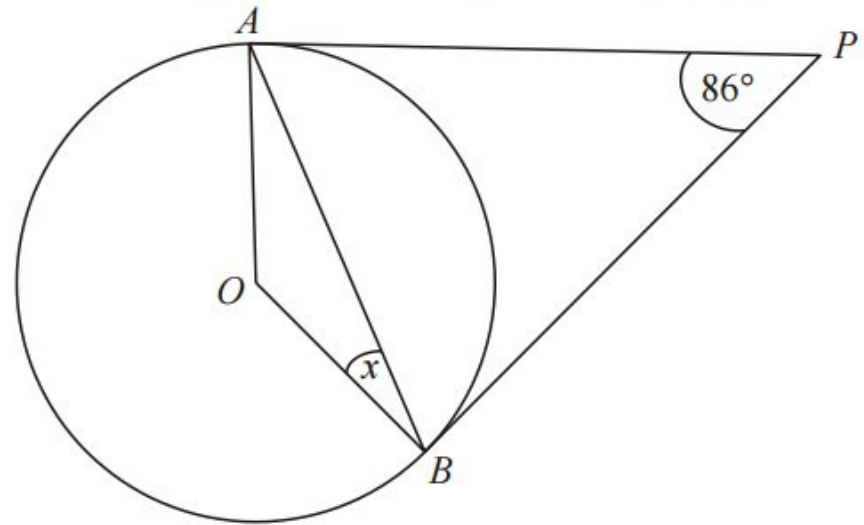


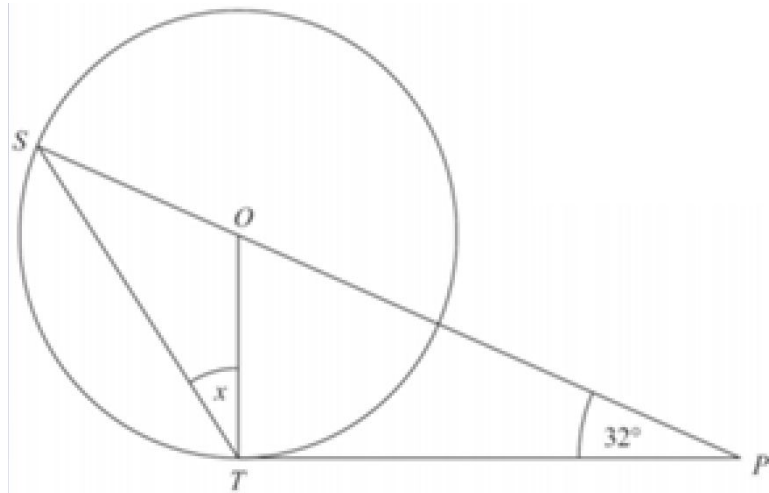
Diagram **NOT** accurately drawn to scale.

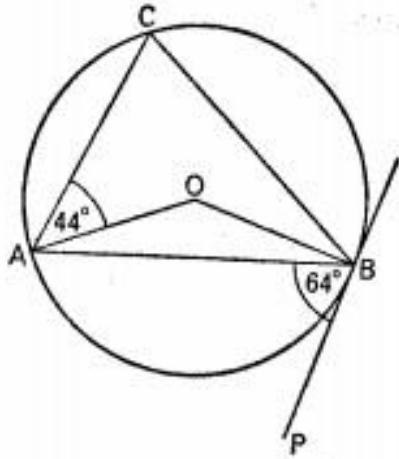
S and T are points on the circumference of a circle, center O . PT is tangent to the circle and SOP is a straight line.

$\angle OPT$ is 32° .

What's x .

More Practice





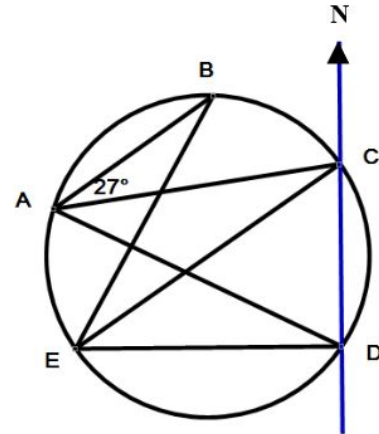
PB is tangent at B . The center of the circle is O . $\angle PBA = 64^\circ$ and $\angle OAC = 44^\circ$, calculate $\angle OAB$ and $\angle OBC$.

A, B, C, D, E are points on a circle. C is exactly on top of D and E is exactly to the left of D . $\angle CAB = 27^\circ$ and $\angle BED = 87^\circ$.

a) find $\angle CED$

b) why is EC the diameter of the circle?

c) find $\angle BDE$



Radius of circle is 4.
MN is $4\sqrt{3}$.
M is midpoint of arc AB .
What is $\angle ACM$.

