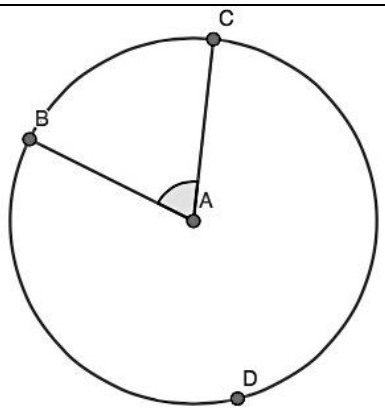
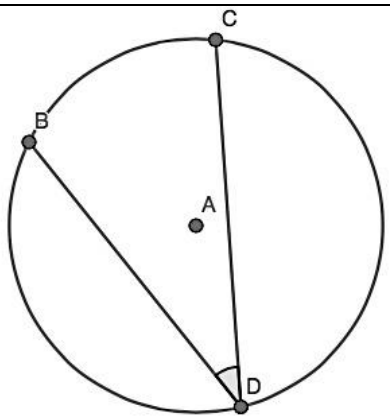
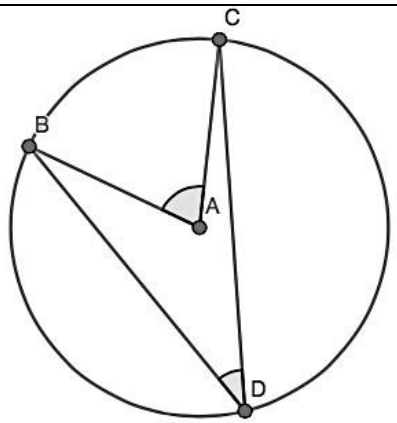
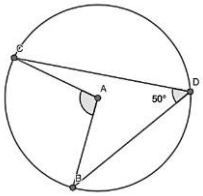
Angles of Circles Notes

Central Angle: An angle whose vertex is at the center of a circle.
Inscribed Angle: An angle whose vertex is on the circle and whose sides contain chords of a circle.
Arc measure: The angle that an arc makes at the center of the circle of which it is a part.
Chord: A segment whose endpoints are on a circle.

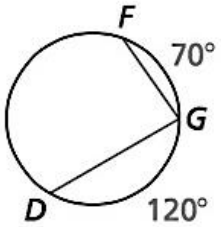
		
$\angle BAC$ is a _____ angle.	$\angle BDC$ is a _____ angle.	$\angle BDC = \frac{1}{2}\angle BAC$

Examples

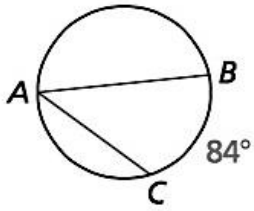
$m\angle A$



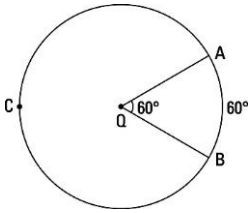
$m\angle G$



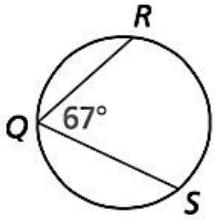
$m\angle A$



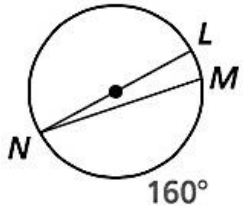
$m\widehat{BCA}$



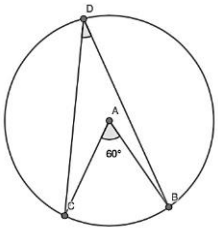
$m\widehat{RS}$



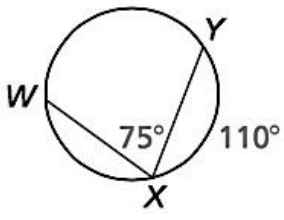
$m\angle N$



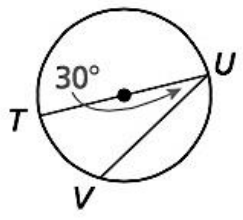
$m\angle D$



$m\widehat{WX}$

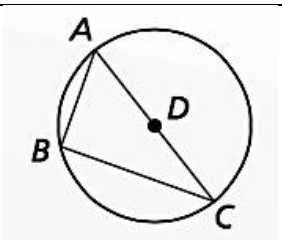
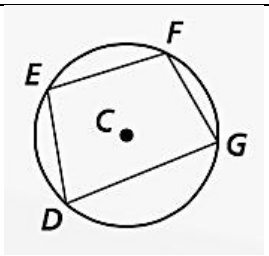
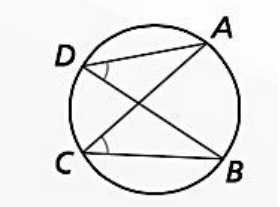


$m\widehat{VU}$

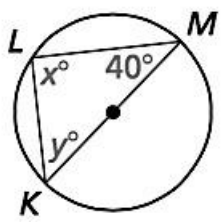


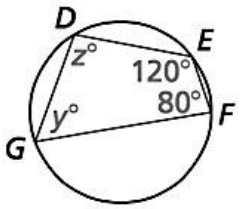
Inscribed Polygon Notes

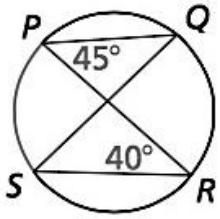
Inscribed Polygon: A polygon whose vertices all lie on a circle.

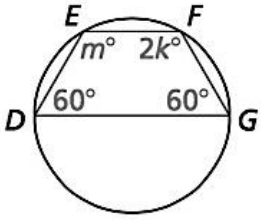
Inscribed Right Triangle Theorem If a right triangle is inscribed in a circle, then the hypotenuse is a diameter of the circle. Conversely, if one side of an inscribed triangle is a diameter of the circle, then the triangle is a right triangle and the angle opposite the diameter is the right angle. $m\angle ABC = 90°$ if and only if $\overline{AC}$ is a diameter of the circle.	
Inscribed Quadrilateral Theorem A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary. D, E, F, and G lie on $\odot C$ if and only if $m\angle D + m\angle F = m\angle E + m\angle G = 180°$.	
Inscribed Angles of a Circle Theorem If two inscribed angles of a circle intercept the same arc, then the angles are congruent. $\angle ADB \cong \angle ACB$	

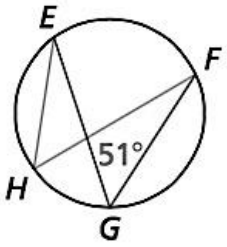
Examples

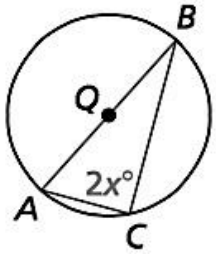








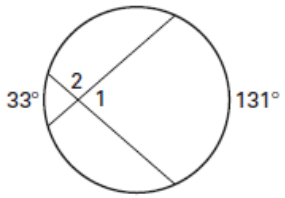


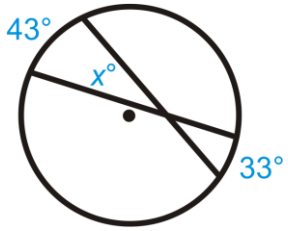


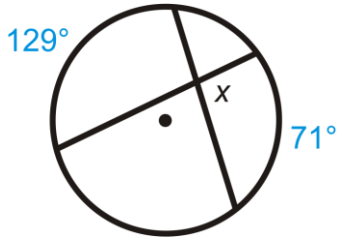
Chord Angles

- A chord is a segment whose end points lie on the circumference of a circle.
- Find the measure of arcs and angles if the angle is inside the circle

$$Angle = \frac{Arc + Arc}{2}$$



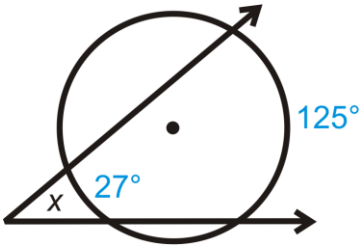


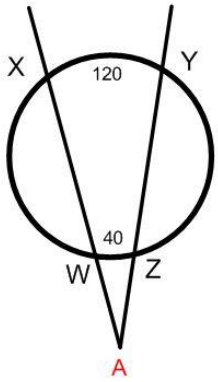


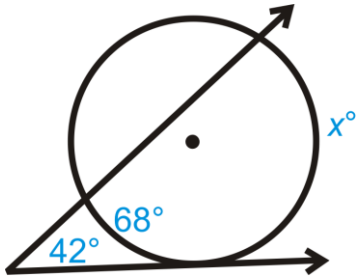
Secant Angles

- A secant line is a line that intersects a circle at two points.
- Find the measure of arcs and angles if the angle is outside the circle.

$$Angle = \frac{Large\ Arc - Small\ Arc}{2}$$

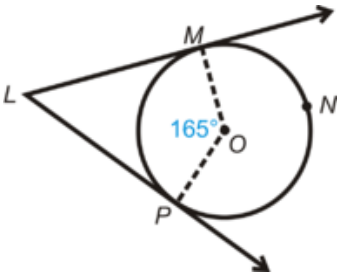


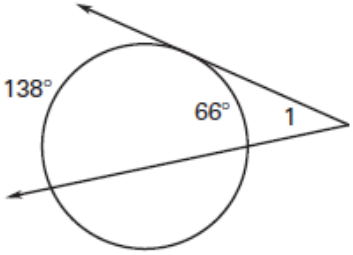


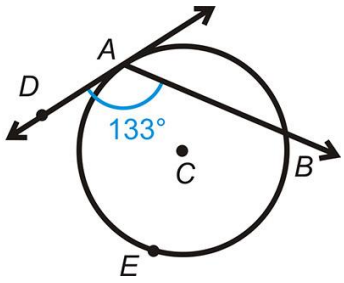


Tangent Angles

- A tangent line is a line that intersects a circle at exactly one point.

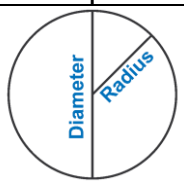






Arc Length and Area of Sectors

Semicircle – half of a circle
Major arc – part of a circle that is larger than a semicircle
Minor arc – is a part of a circle that is smaller than a semicircle.



$r = radius$
$d = diameter$
$\theta = central\ angle$

Area Formulas

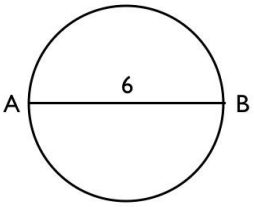
$$Circle = \pi r^2$$
$$Triangle = \frac{1}{2} b \cdot h$$
$$Rectangle = b \cdot h$$
$$Sector = \frac{\pi r^2 \theta}{360^o}$$

$$Circumference = 2\pi r$$
$$Arc\ Length = \frac{2\pi r \theta}{360^o}$$

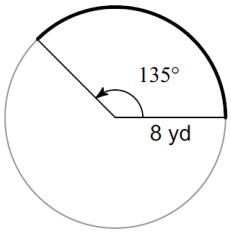
- Arc length is a portion of the circumference

Find the circumference of the circle.

Find the circumference of the circle.



The the legnth of the arc.



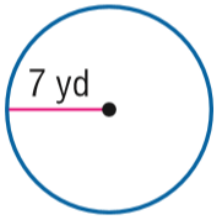
A circle with circumference 18 has an arc with a 120^o central angle. What is the length of the arc?

A circle has a circumference of 17π. What is the radius of the circle?

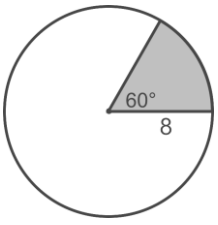
A circle has an arc length of 3π with a radius of 6. Find the central angle of the arc.

- A Sector is a portion of a circle bounded by two radii and their intercepted arc.

Find the area of the circle.



Find the area of the sector.



A circle with area 4π has a sector with a 90^o central angle. What is the area of the sector?

A circle has an area of 25π. What is the radius of the circle?

Find the area of the segment.