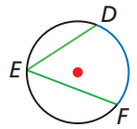
Section Overview

Professional Development

Inscribed Angles — Lessons 11-4

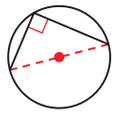
Why? Understanding inscribed angles allows you to solve application problems.

$\angle DEF$ is an inscribed angle.
$\overset{\frown}{DF}$ is an intercepted arc.
$\overset{\frown}{DF}$ *subtends* $\angle DEF$.

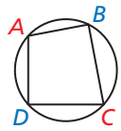


Inscribed Angle Theorem
The measure of an angle inscribed in a circle is half the measure of its intercepted arc. $m\angle DEF = \frac{1}{2} m\overset{\frown}{DF}$

An inscribed angle subtends a semicircle if and only if the angle is a right angle.



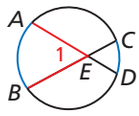
A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.
$\angle A$ and $\angle C$ are supplementary.
$\angle B$ and $\angle D$ are supplementary.



Angle and Segment Relationships in Circles — Lessons 11-5, 11-6

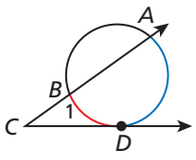
Why? Many professional fields of study, such as ophthalmology and archaeology, use angle and segment relationships in circles.

Segments intersecting inside the circle

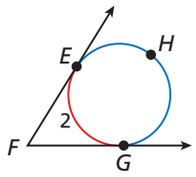


$m\angle 1 = \frac{1}{2}\left(m\overset{\frown}{AB} + m\overset{\frown}{CD}\right)$

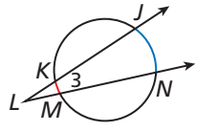
Segments intersecting outside the circle



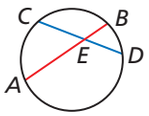
$m\angle 1 = \frac{1}{2}\left(m\overset{\frown}{AD} - m\overset{\frown}{BD}\right)$



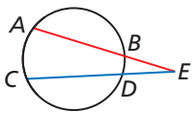
$m\angle 2 = \frac{1}{2}\left(m\overset{\frown}{EHG} - m\overset{\frown}{EG}\right)$



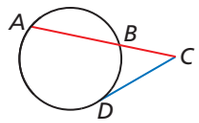
$m\angle 3 = \frac{1}{2}\left(m\overset{\frown}{JN} - m\overset{\frown}{KM}\right)$



If chords $\overline{AB}$ and $\overline{CD}$ intersect at E, then $AE \cdot EB = CE \cdot ED$.



If secants $\overline{AE}$ and $\overline{CE}$ intersect at E, then $AE \cdot BE = CE \cdot DE$.



If secant $\overline{AC}$ and tangent $\overline{DC}$ intersect at C, then $AC \cdot BC = DC^2$.

Circles in the Coordinate Plane — Lessons 11-7

Why? The location of weather stations, radio towers, and radar devices can be planned by using circles in the coordinate plane.

Equation of a Circle

$$(x - h)^2 + (y - k)^2 = r^2$$

r = **radius**
(h, k) = **coordinates of the center**