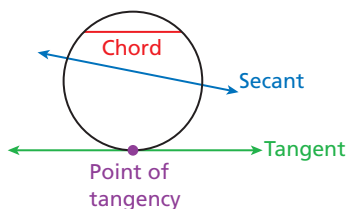


Section Overview

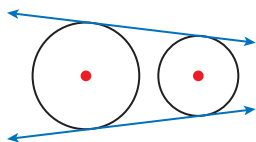
Lines That Intersect Circles

Lesson 11-1

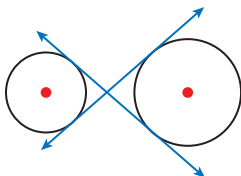
Why? You can use a circle and the special lines that intersect it to solve problems, such as finding a location on Earth seen from a satellite.



Common External Tangents

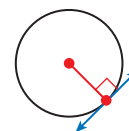


Common Internal Tangents

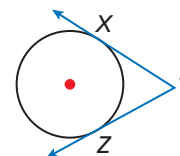


Properties of Tangents

A line or segment is tangent to a circle if and only if it is perpendicular to the radius at the point of tangency.



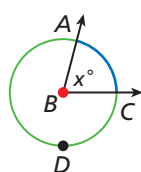
If two segments are tangent to a circle from the same external point, then the segments are congruent.



Arcs, Chords, and Sectors

Lesson 11-2, 11-3

Why? You can apply properties of arcs and chords to create and analyze circle graphs.



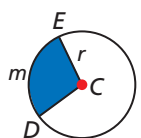
Minor Arc

$$m\widehat{BC} = m\angle BAC = x^\circ$$

Major Arc

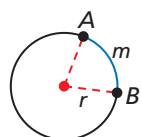
$$m\widehat{BDC} = 360^\circ - x^\circ$$

Sector of a Circle



$$A = \pi r^2 \left(\frac{m^\circ}{360^\circ} \right)$$

Arc Length

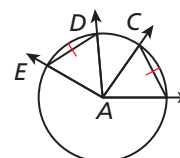


$$L = 2\pi r \left(\frac{m^\circ}{360^\circ} \right)$$

Properties of Arcs and Chords

In a circle or congruent circles:

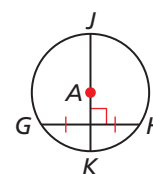
- Congruent central angles have congruent chords.
- Congruent chords have congruent arcs.
- Congruent arcs have congruent central angles.



$$\begin{aligned} \angle EAD \cong \angle BAC &\rightarrow \overline{DE} \cong \overline{BC} \\ \overline{DE} \cong \overline{BC} &\rightarrow \widehat{DE} \cong \widehat{BC} \\ \widehat{DE} \cong \widehat{BC} &\rightarrow \angle EAD \cong \angle BAC \end{aligned}$$

In a circle:

- If a radius (or diameter) is perpendicular to a chord, then it bisects the chord and its arc.
- The perpendicular bisector of a chord is a radius (or diameter).



$$\begin{aligned} \overline{AK} \perp \overline{GH} &\rightarrow \overline{AK} \text{ bisects } \overline{GH} \text{ and } \widehat{GH}. \\ \overline{JK} \text{ is a } \perp \text{ bisector of } \overline{GH}. &\rightarrow \overline{JK} \text{ is a diameter of } \odot A. \end{aligned}$$