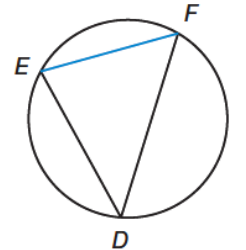


Geometry Lesson 64

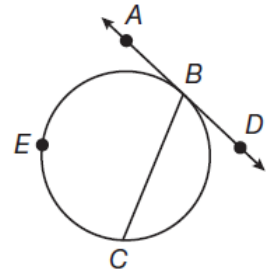
Objective: TSW use angles on the interior of circles.

A segment or arc is said to subtend an angle if the endpoints of the segments or arc lie on the sides of the angle. In the diagram, $\angle EDF$ is subtended by \widehat{EF} or \overline{EF} .



Inscribed angles are one type of subtended angle. Another type of subtended angle is one formed by a tangent to the circle and a chord of the circle.

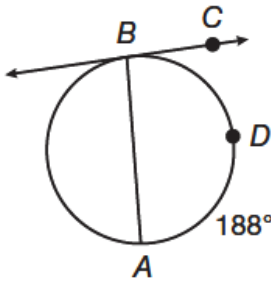
Theorem 64-1 - The measure of an angle formed by a tangent and a chord is equal to half the measure of the arc that subtends it.



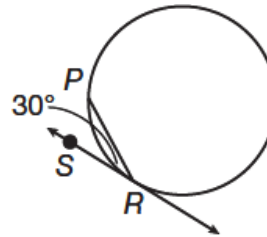
Example 1 Finding Angle Measures with Tangents and Chords

Find the indicated measure, given that \overline{BC} and \overline{SR} are tangents.

a. $m\angle ABC$

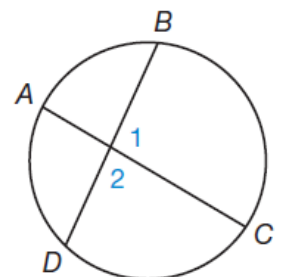


b. $m\angle P_R$



SOLUTION

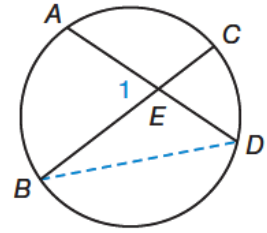
Theorem 64-2 - The measure of an angle formed by two chords intersecting in a circle is equal to half the sum of the intersected arcs.



Example 2 Proving Theorem 64-2

Given: \overline{AD} and \overline{BC} intersect at E .

Prove: $m\angle 1 = \frac{1}{2}(m\widehat{AB} + m\widehat{CD})$



SOLUTION

Statements

Reasons

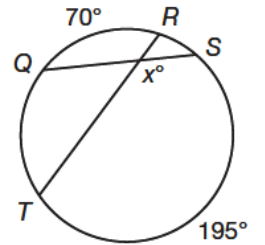
- 1.
- 2.
- 3.
- 4.

- 5.
- 6.

Example 3 Finding Angle Measures of the Intersection of Two Chords

Find x .

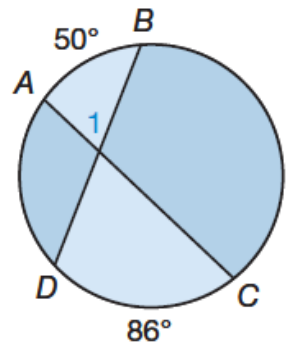
SOLUTION



Example 4 Application: Tiling

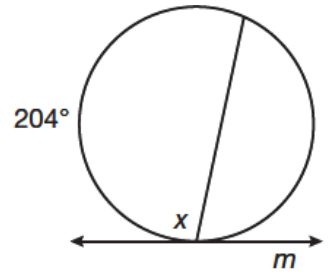
Albert is laying tile in his kitchen in a circular pattern as shown. He knows the $m\widehat{AB} = 50^\circ$ and $m\widehat{CD} = 86^\circ$. He wants to know the measure of angle 1 so he can cut the tile accordingly.

SOLUTION

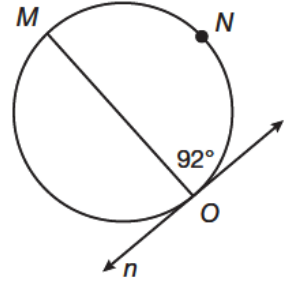


You Try!!!!

a. Find the measure of angle x in the figure. Line m is tangent to the circle.



b. Find the measure of \widehat{MNO} in the figure. Line n is tangent to the circle.

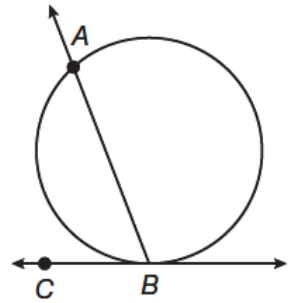


c. Prove Theorem 64-1.

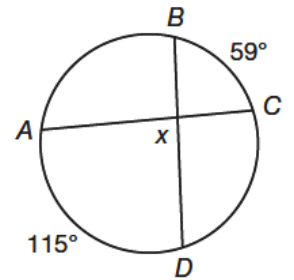
Given: Tangent \overrightarrow{BC} and secant \overrightarrow{BA} .

Prove: $m\angle ABC = \frac{1}{2}m\widehat{AB}$

Hint: There are two cases you must prove: one where \overline{AB} is a diameter and one where \overline{AB} is not a diameter.



d. Find the measure of angle x .



e. An artist is drawing a design for a company logo that has a capital "R" inside a large circle as shown. She first draws a baseline at the top of the R. The R is supposed to be at a 60° angle in relation to the baseline. What is the measure of the arc m , which extends leftward from the top of the R?

