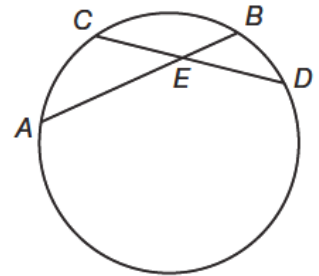# Geometry Lesson 86

Objective: TSW determine chord length.

A chord is a segment whose endpoints lie on a circle. Theorem 86-1 relates the lengths of chord segments when two chords intersect.

Theorem 86-1 - If two chords intersect in a circle, then the products of the chord segments are equal. In the diagram, (AE)(EB) = (CE)(ED).
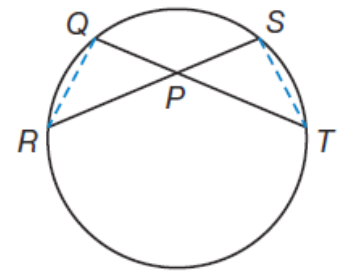
Example 1 Proving Theorem 86-1

Given: Chords $\overline{TQ}$ and $\overline{RS}$ intersect at point P.

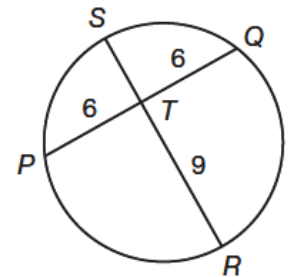Prove: $(QP)(PT) = (RP)(PS)$

    SOLUTION

Example 2 Finding Chord Lengths

In the circle, chords $\overline{PQ}$ and $\overline{RS}$ intersect at T.
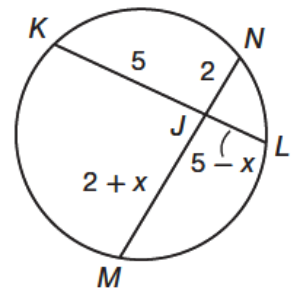
Determine ST.

    SOLUTION

Example 3 Solving for Unknowns with Intersecting Chords

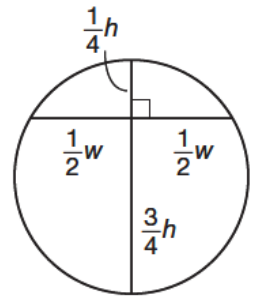In this circle, use the expressions for the segment lengths to write and solve an equation for x.

    SOLUTION

Example 4 Application: Aviation

A "super-heavy" passenger jet has an upper passenger deck that is located $\frac{3}{4}$ of the way up the cylindrical fuselage. What percentage of the height of the fuselage is the width of the upper deck?

    SOLUTION

You Try!!!!

In $\odot G$, chords $\overline{AB}$ and $\overline{CD}$ intersect at E. Use this information for parts a and b.
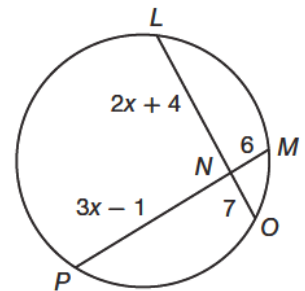
a.Determine DE if $AE = 3$, $BE = 16$, and $CE = 9$.

b.Suppose $AE = 7$, $BE = y$, $CE = 4 - y$, and $DE = 2$.
Write and solve an equation for y.

c. In the diagram, $\overline{LO}$ and $\overline{PM}$ intersect at N.
Find the value of x.

d.Civil Engineering A cylindrical natural gas pipeline is supported at two points that are 10% of the diameter of the pipeline above its lowest point. If the diameter of the pipeline is 4 feet, 9 inches, how far apart are the supports?