Lesson 10-6
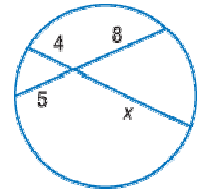
Example 1

Find x.

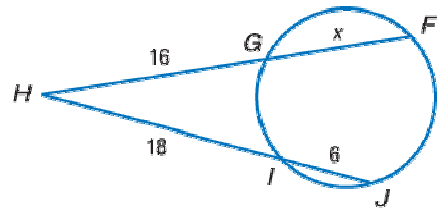**Solution**

Since there are two intersecting chords, the products of the segments are equal.

$$4 \cdot x = 5 \cdot 8$$
$$4x = 40$$
$$x = 10$$

Example 2

ARTCHITECTURE An architect is redesigning a museum. One of the rooms will contain a circular platform to display the skeleton of a prehistoric mammal. Steel cables represented by the two secant segments shown in the drawing will be used to brace the skeleton. Find x.

Solution

$\overline{HF}$ and $\overline{HJ}$ are secant segments. $\overline{HG}$ is the external part of $\overline{HF}$, and $\overline{HI}$ is the external part of $\overline{HJ}$. The theorem refers to the length of the entire secant segment and its external part.

$$HF \cdot HG = HJ \cdot HI$$
$$(16 + x)16 = 24 \cdot 18$$
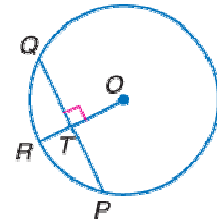$$432 = 256 + 16x$$
$$176 = 16x$$
$$11 = x$$

Example 3

Find x.
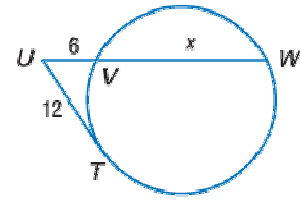
Solution

$\overline{TU}$ is a tangent segment. $\overline{UW}$ is a secant segment, and $\overline{UV}$ is its external part.

$$(TU)^2 = UW \cdot UV$$
$$12^2 = (x + 6)6$$
$$144 = 6x + 36$$
$$108 = 6x$$
$$18 = x$$

Example 4

In circle O, radius $\overline{OR}$ is perpendicular to chord $\overline{PQ}$ at T. Find PT if $PQ = 7$ cm.

Solution

The first step is to make a diagram and label it using the given facts.

The problem states that $\overline{OR}$ is perpendicular to $\overline{PQ}$. Therefore, $\overline{OR}$ also bisects $\overline{PQ}$. If $PQ = 7$ cm, then $PT = 3.5$ cm.