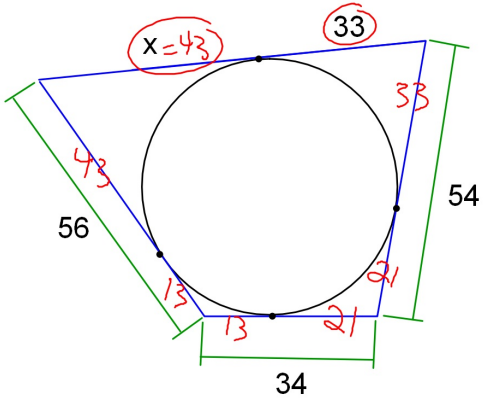
The circle is inscribed in the quadrilateral.
Find the value of x.

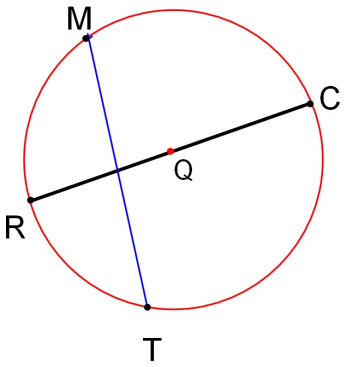


Diameter:
Segment connecting two points
on the circle that passes through the center.

Chord:
Segment connecting two points on the circle.

Which statement is true:

1. All Chords are Diameters.
2. All Diameters are Chords. ✓



Draw and name a Diameter

$\overline{RC}$

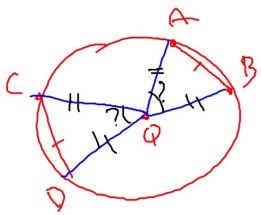
Draw and name a Chord

$\overline{MT}$

Place a point on your paper and label it Q.

Construct Circle Q.

Draw two chords that are equal in length
and label them $\overline{AB}$ and $\overline{CD}$.



Draw radii to create angles ∠AQB and ∠CQD

Measure these two central angles.

$\cong$

What conclusion can you make?

$2 \cong$ chords $\rightarrow 2 \cong$ central $\angle$s

What is true about arc $\overset{\frown}{AB}$ and $\overset{\frown}{CD}$?

$2 \cong$ chords $\rightarrow 2 \cong$ arcs

We already know that the measure of an arc is equal to the measure of its central angle.

Therefore, congruent central angles have congruent arcs.

Theorem 12-4

Within a circle or in congruent circles

(1) Congruent central angles have congruent chords.

(2) Congruent chords have congruent arcs.

(3) Congruent arcs have congruent central angles.

Central Angle: Angle whose vertex is the center of a circle.

Inscribed angle: Angle whose vertex is a point on the circle.

Sides of the angle are chords

Draw another circle and label the center P.

Draw a central angle of 50^0 and label the points on the circle A and C.

What is the measure of arc $\overset{\frown}{AC}$?

Pick another point on the circle but not on arc $\overset{\frown}{AC}$. Label this point B. Find the measure angle $\angle ABC$.

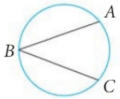
What do you this is the relationship between an inscribed angle and its intercepted arc?

the inscribed angle is half of the arc.

Theorem 12-9 **Inscribed Angle Theorem**

The measure of an inscribed angle is half the measure of its intercepted arc.

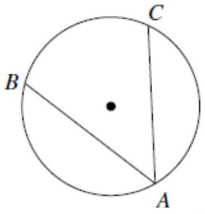
$$m\angle B = \frac{1}{2}m\overset{\frown}{AC}$$



State if each angle is an inscribed angle.

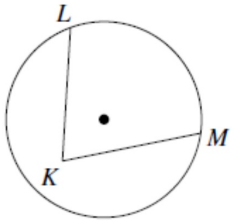
If it is, name the angle and the intercepted arc.

1)



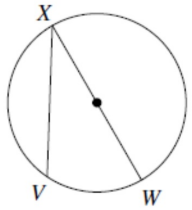
Yes; $m\angle BAC$, $\overset{\frown}{BC}$

2)



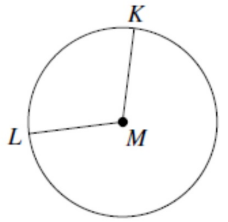
No

3)



Yes; $m\angle WXV$, $\overset{\frown}{WV}$

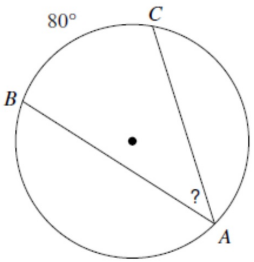
4)



No

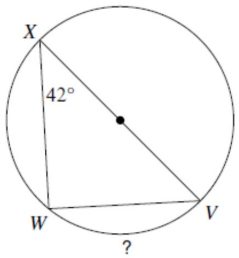
Find the measure of each ?.

5)



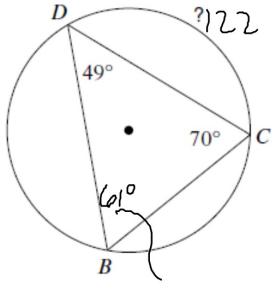
40°

6)



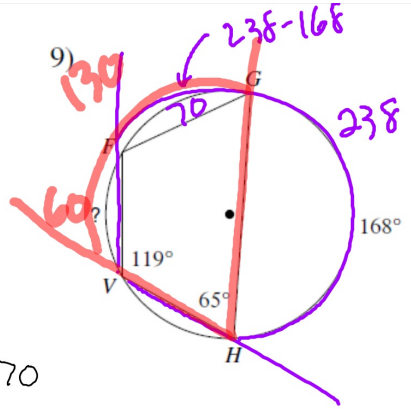
84°

8)



122°

180-49-70

61

9)