

Name: KEY!

Hour: _____

Unit N: Circles

Geometry 2nd Semester

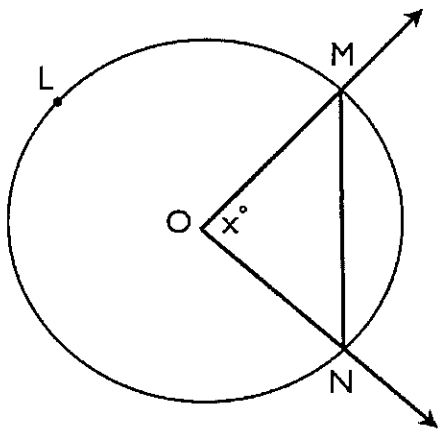


Lesson 14-1: Chord Length and Arc Measure

Vocabulary

Minor Arc: an arc w/ a measure less than 180°

Major Arc: an arc w/ a measure between 180° & 360°



Parts:

Central Angle $\angle MON$

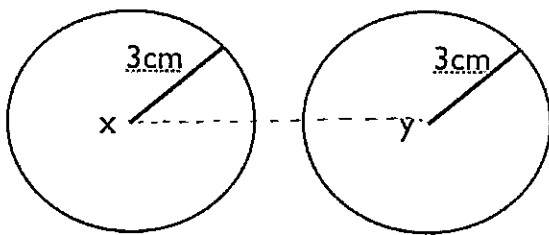
Chord \overline{MN}

Arc \widehat{MN} (minor arc)

$$m\angle MON = x^\circ$$

$$m\widehat{MN} = x^\circ$$

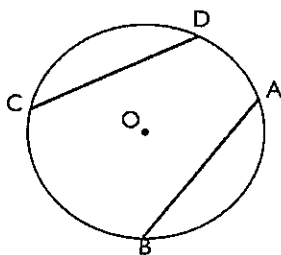
Congruent Circles: two circles are congruent if they have the same radii



$\odot X$ can be mapped onto $\odot Y$
by the translation vector
 \overline{XY}

Arc-Chord Congruence Theorem: in a circle or congruent circles:

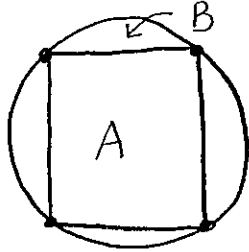
1. If 2 arcs have same measure, they are \cong & their chords are \cong
2. If 2 arcs have same length, their minor arcs have the same measure



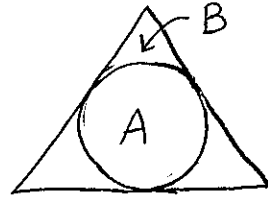
→ fits snugly "inside" another shape

Inscribed: figure A is inscribed in a figure B if each vertex of fig. A is on fig. B.

Examples

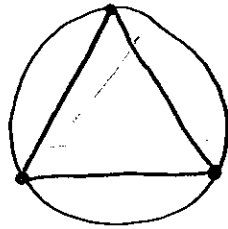


or

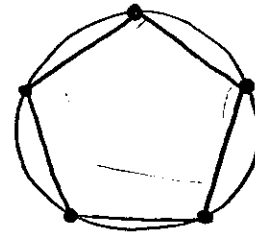


Circumscribed: the circle that passes through all the vertices of a figure

Examples

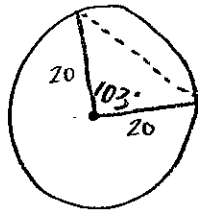


or



Practice

1. Find the length of a chord of a 103° arc in a circle with radius 20cm.



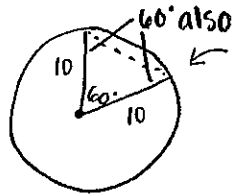
$$a^2 = 20^2 + 20^2 - 2 \cdot 20 \cdot 20 \cdot \cos 103^\circ$$

$$\sqrt{a^2} = \sqrt{979.96}$$

$$a = 31.30m$$

2. A circle has a radius of 10". Find the length of a chord of a...

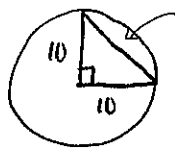
- a. 60° arc



← Equilateral Δ , so all sides are =

$$10$$

- b. 90° arc



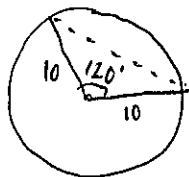
Right Δ , so Pythag!

$$10^2 + 10^2 = c^2$$

$$\sqrt{200} = \sqrt{c^2}$$

$$c = 14.14$$

- c. 120° arc



$$a^2 = 10^2 + 10^2 - 2 \cdot 10 \cdot 10 \cdot \cos 120^\circ$$

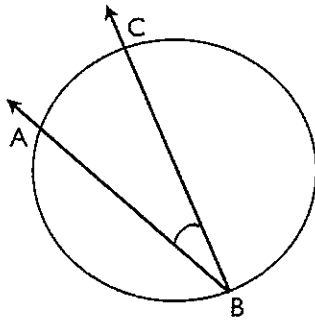
$$\sqrt{a^2} = \sqrt{300}$$

$$a = 17.3$$

Lesson 14-2: The Inscribed Angle Theorem

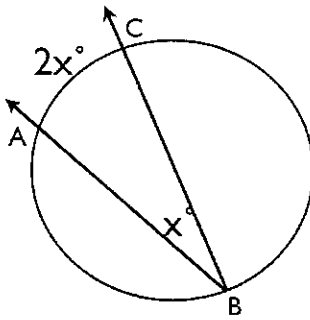
Vocabulary

Inscribed Angle: an angle is inscribed in a circle if & only if:
a) the vertex of the angle is on the circle &
b) each side of the angle intersects the circle at one point

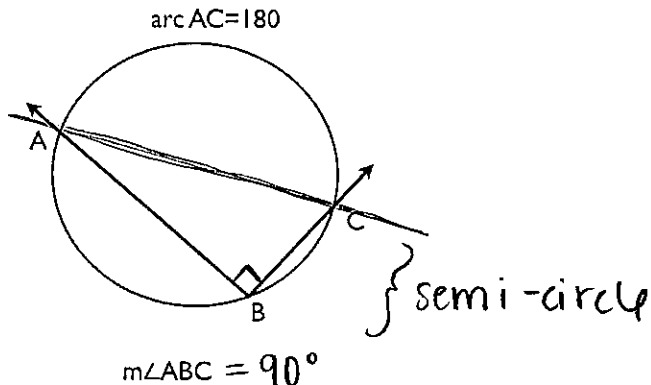


$\angle ABC$ is an inscribed angle.

Inscribed Angle Theorem: In a circle, the measure of an inscribed angle is half the measure of its intercept arc.

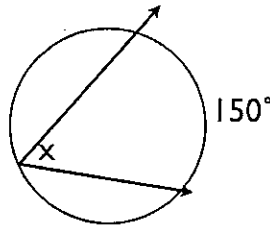


Theorem: an angle inscribed in a semi-circle is a right angle, 90° .



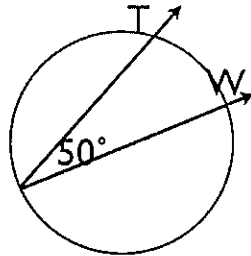
Practice

1. Find the $m\angle X$.



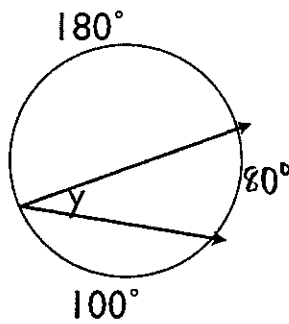
$$x = \frac{1}{2} 150$$
$$= 75^\circ$$

2. Find the measure of arc TW.



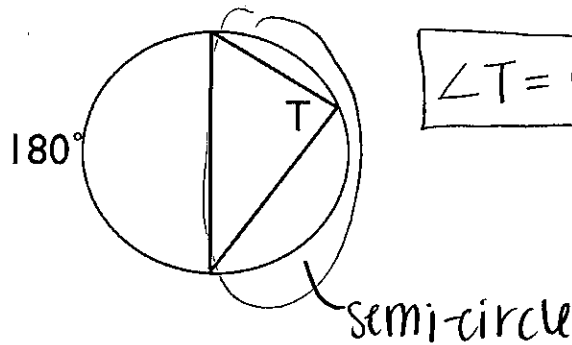
$$\widehat{TW} = 50 \cdot 2$$
$$= 100^\circ$$

3. Find $m\angle Y$.



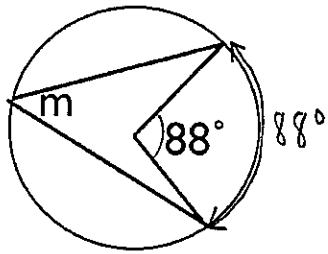
$$\angle Y = \frac{1}{2} \cdot 80$$
$$= 40^\circ$$

4. Find $m\angle T$.



$$\angle T = 90^\circ$$

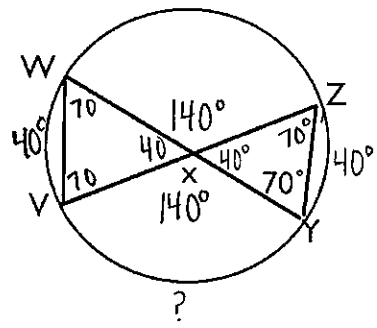
5. Find the $m\angle m$.



$$m\angle m = \frac{1}{2} \cdot 88$$

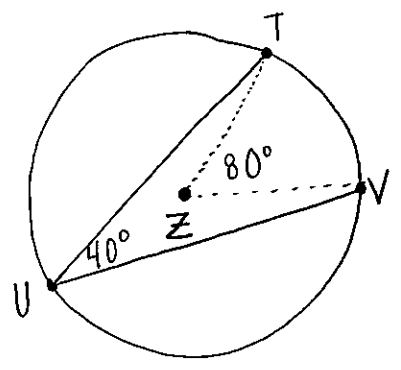
$$= 44^\circ$$

6. Find the measure of arc VY.



$$\widehat{VY} = 140^\circ$$

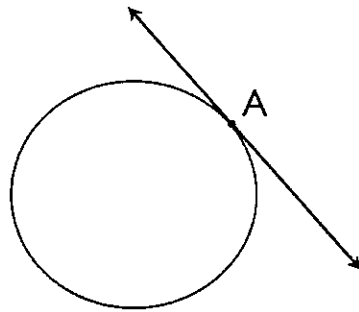
7. Draw a circle with center Z that has inscribed angle $\angle TUV$, and arc TV is 80° . Label everything appropriately.



Lesson 14-5: Tangents to Circles & Spheres

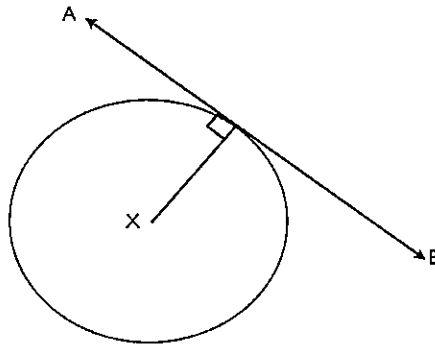
Vocabulary

Tangent: a line in a plane of a circle which intersects the circle in exactly one point



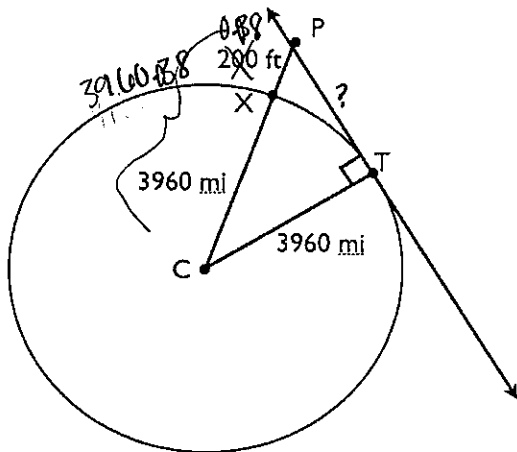
A is the point of tangency

Radius-Tangent Theorem: a line is tangent to a circle if & only if it is perpendicular to the radius' endpoint on the circle.



Practice

- How far is it to the horizon from a point P that is 200 feet above ground?



① convert everything to miles

$$\frac{200}{5280} = .038 \text{ mi}$$

$$3960^2 + x^2 = 3960.038^2$$

$$x^2 = 300.96$$

$$x = 17.3 \text{ miles}$$