

Chapter 10- Lesson 1

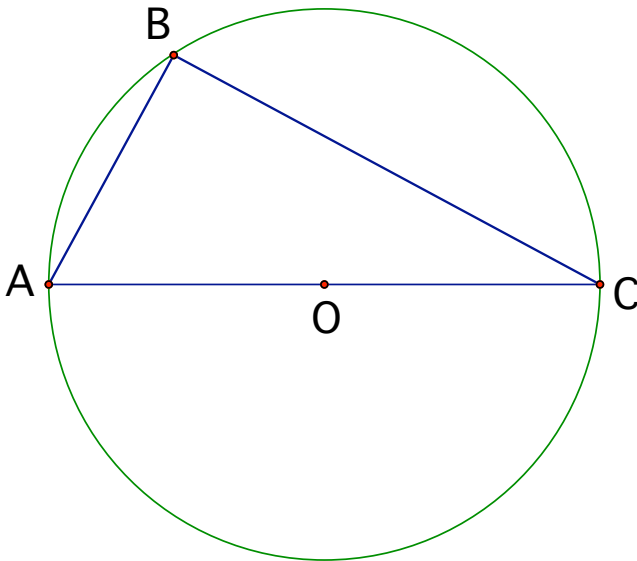
The Measure of an Inscribed Angle¹

Goals

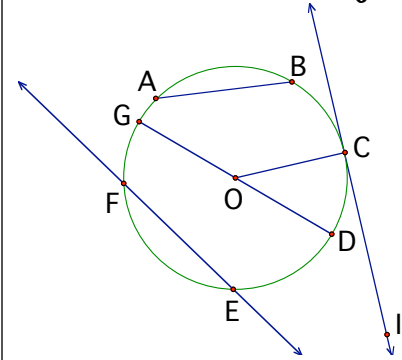
- Learn how the measure of an inscribed angle is related to the measure of the intercepted arc and the measure of the central angle.

1. Puzzle 1

Examine the triangle below which is inscribed in $\odot O$ (the circle with center O). What kind of triangle is $\triangle ABC$? Justify your conjecture.



Names of Lines and Segments



A **chord**, \overline{AB} , of a circle is a line segment which has both endpoints on the **circumference** of a circle.

A **diameter**, \overline{GD} , is a chord passing through the center.

A **radius** (plural: radii), \overline{OC} , of a **circle** or **sphere** is any **line segment** from its center to its circumference.

A **secant line**, \overleftrightarrow{FE} , of a **curve** is a line that intersects at least two **points** on the curve.

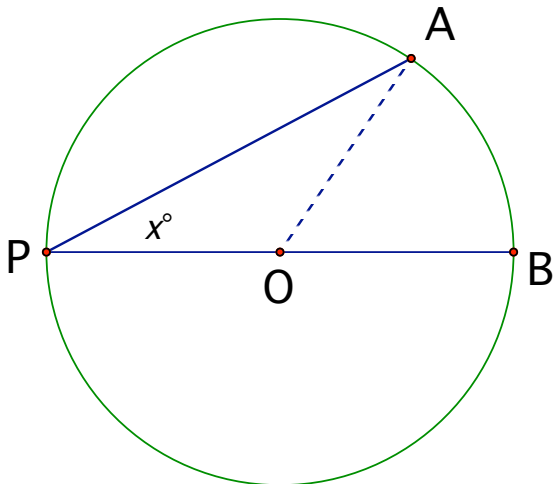
A **tangent line** (or simply the **tangent**), \overleftrightarrow{CI} , to a **curve** at a given **point** is the **straight line** that "just touches" the curve at that point— the *point of tangency*. This is a different from (but connected to) the "tangent ratio" of trigonometry.

¹ Based on "Geometry, A Guided Inquiry", Chakerian, Crabill, Stien

Chapter 10: Lesson 1: The Measure of an Inscribed Angle

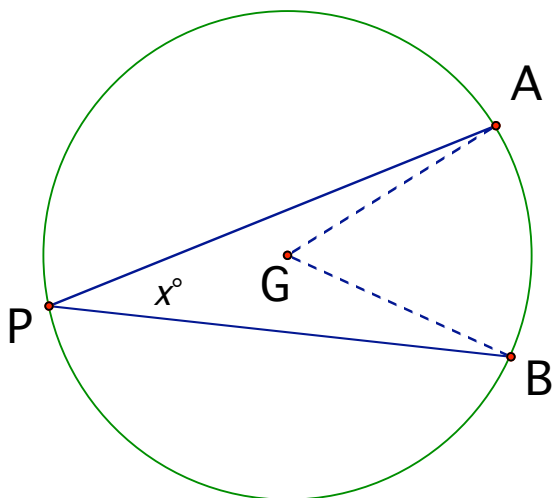
2. Puzzle 2

Consider $\odot O$. Suppose that $m\angle APB = x^\circ$. What would be the measure, in terms of x , of $\angle AOB$? Justify.

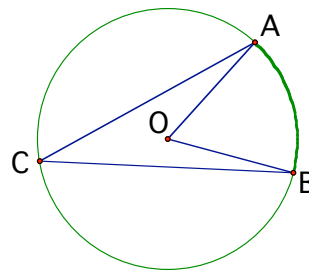


3. Puzzle 3

Consider $\odot G$ below. Suppose that $m\angle APB = x^\circ$. What would be the measure, in terms of x , of $\angle AGB$? Justify.



Names of Angles and Arcs



A **central angle**, $\angle AOB$, is an **angle** whose vertex is the center of a **circle**, and whose sides pass through a pair of points on the circle.

An **inscribed angle**, $\angle ACB$, which has one endpoint on the circumference of a circle and whose sides pass through a pair of points on the circumference of the circle.

An **arc**, \widehat{AB} , is a portion of the circumference of a circle. The **minor arc** is the arc which is smaller than the **semicircle** while the **major arc** is larger than the semicircle. Unless stated otherwise we are interested in the minor arc.

The **angular measure of the minor arc** is equal (by definition) to the measure of its central angle.

4. Complete the following: The measure of any inscribed angle of a circle _____

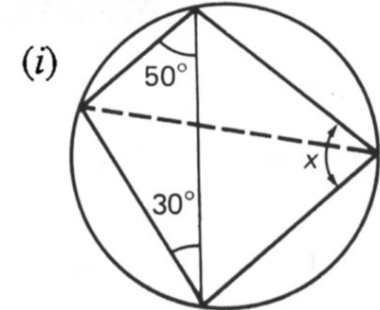
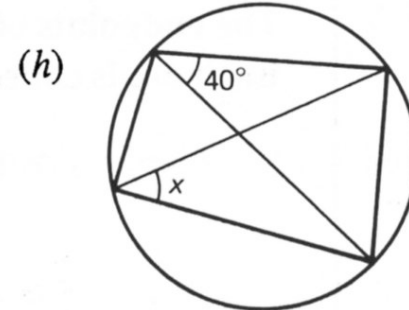
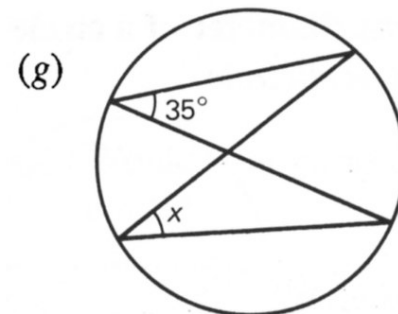
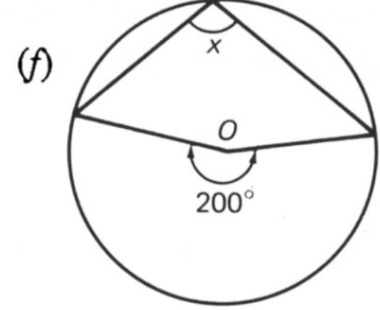
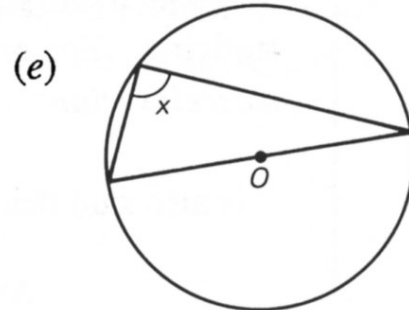
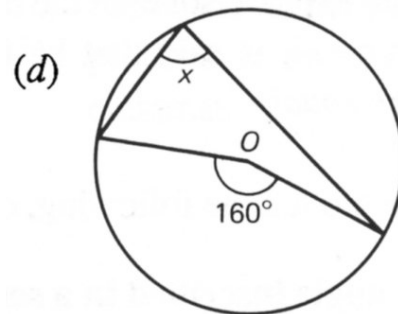
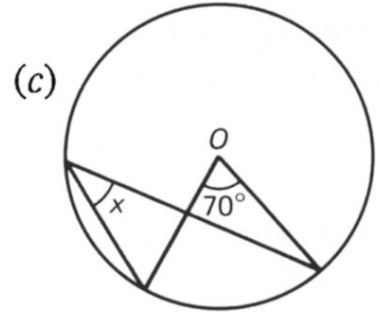
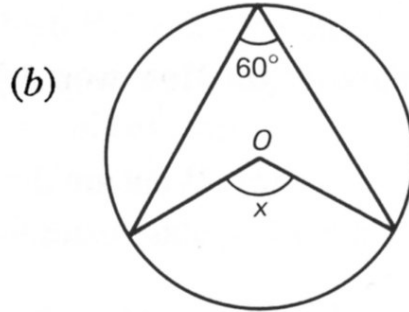
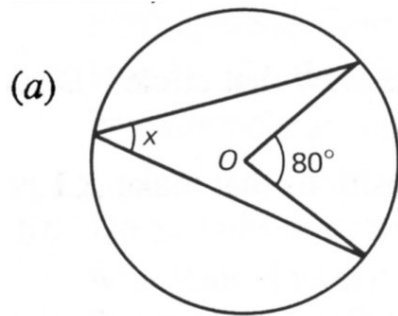
_____.

Chapter 10: Lesson 1: The Measure of an Inscribed Angle

5. More Puzzles

Find the degree measure of x .

In the following drawings, O denotes the center of the circle. Also, if a line looks like a diameter, you may assume it is a diameter.



Chapter 10: Lesson 1: The Measure of an Inscribed Angle

