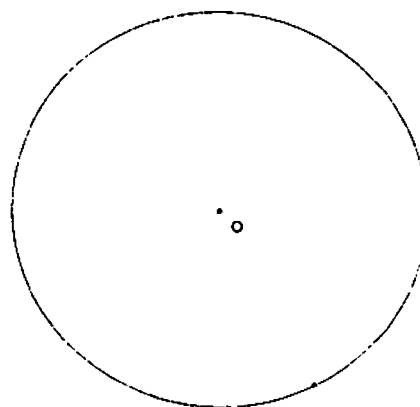
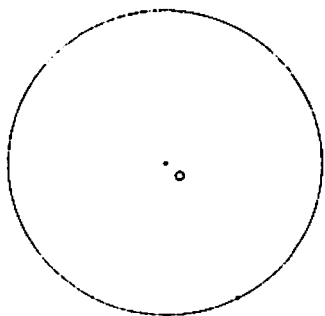
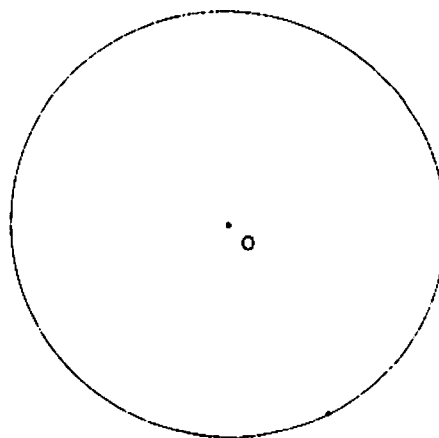
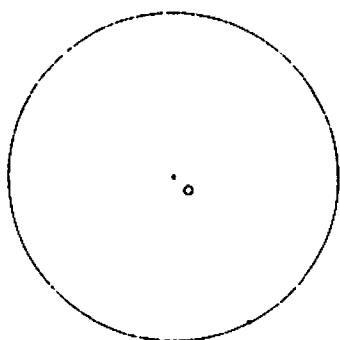
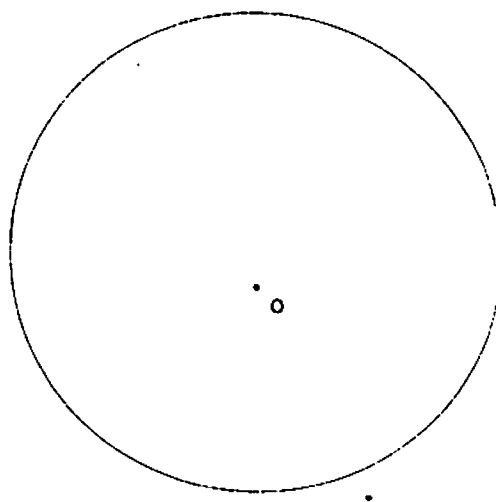
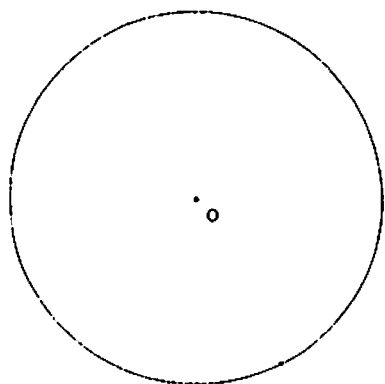


Paper Circles



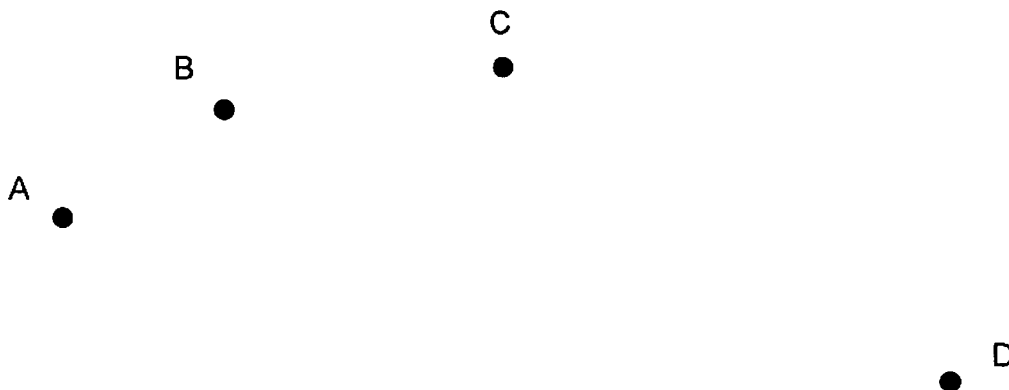
Problem Solving: Applying Chord Properties with Paper and Pencil

Problem No. 2

While excavating an archaeological site, four separate structures are uncovered that seem to be related to each other. The archaeologists suspect that these structures are part of a system of structures that form a circle.

What could be done to check this hypothesis?

If the hypothesis seems to be confirmed, how could they determine the centre and radius of this circle to target excavations? In how many different ways could this be done?



Reproduced with permission (pending) from Sue Johnston-Wilder and John Mason (eds.), *Developing Thinking in Geometry* (London, UK: Open University in association with Paul Chapman Publishing, 2005), pp. 50–52.

Exploring Angles Inscribed in Circles with Paper and Pencil

Problem No. 1: Inscribed Angles Subtended from the Same Arc

- Draw a circle and label its centre O.
- Locate four points on the circumference of the circle, label the points A, B, C and D
- Using point A as the vertex and points C and D as the endpoints construct $\angle CAD$.
 $\angle CAD$ is described as an inscribed angle subtended from arc CD.
- Using point B as the vertex and points C and D as the endpoints construct $\angle CBD$.
 $\angle CBD$ is also described as an inscribed angle subtended from arc CD.
- Use a protractor to measure $\angle CAD$ and $\angle CBD$.

What do you notice about the measure of the two inscribed angles?

Compare your findings with the members of your table group.

Exploring Angles Inscribed in Circles with Paper and Pencil

Problem No. 2: Central and Inscribed Angles

- Draw a circle and label its centre O.
- Locate three points on the circumference of the circle; label the points A, B and C.
- Using point O as the vertex and points B and C as the endpoints construct the central angle $\angle COB$.
- Using point A as the vertex and points B and C as the endpoints construct $\angle CAB$.
- Use a protractor to measure $\angle COB$ and $\angle CAB$.

What do you notice about the measures of the central and inscribed angles?

Compare your findings with the members of your table group.

Write a statement about how the relationship between measures of the central and inscribed angle subtended from the same arc.

Exploring Angles Inscribed in Circles with Paper and Pencil

Problem No. 3: Angles Inscribed in a Semicircle

- Draw a circle and label its centre O.
- Draw the diameter of the circle; label the endpoints A and B.
- Identify another point on the circle label it C.
- Using point C as the vertex and points B and A as the endpoints construct the $\angle ACB$, inscribed in the semicircle from arc AB.
- Use a protractor to measure $\angle ACB$.

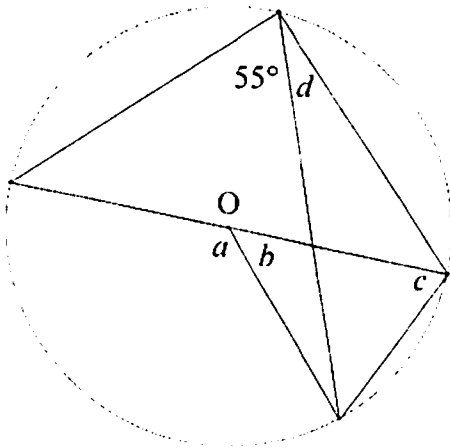
What do you notice about the measure of angle inscribed in the semicircle?

Compare your findings with the members of your table group.

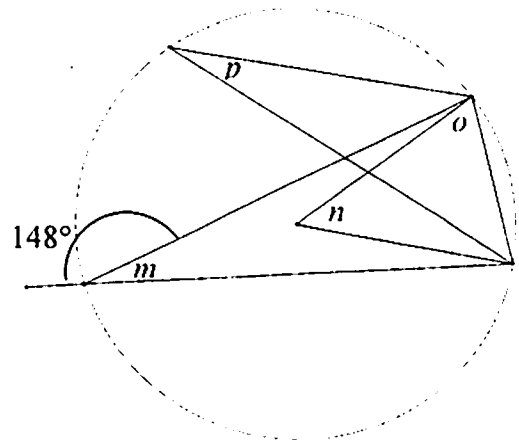
Write a statement about the measure of angle inscribed in a semicircle.

(handout)

Problem Solving: Applying Properties of Angles in a Circle with Paper and Pencil



Problem No. 1



Problem No. 2

Determine the unknown measures and justify your decisions using properties.

Exploring the Relationship between the Radius and Tangent Line with Paper and Pencil

- Draw a circle and label its centre O.
- Draw a tangent to the circle and label the point of tangency A. Label the endpoints of the tangent line CD.
- Use a protractor to measure $\angle CAO$ and $\angle DAO$.

Compare your findings with the members of your table group.

What do you notice about the measure of the two angles formed by the radius and the line tangent to the circle?

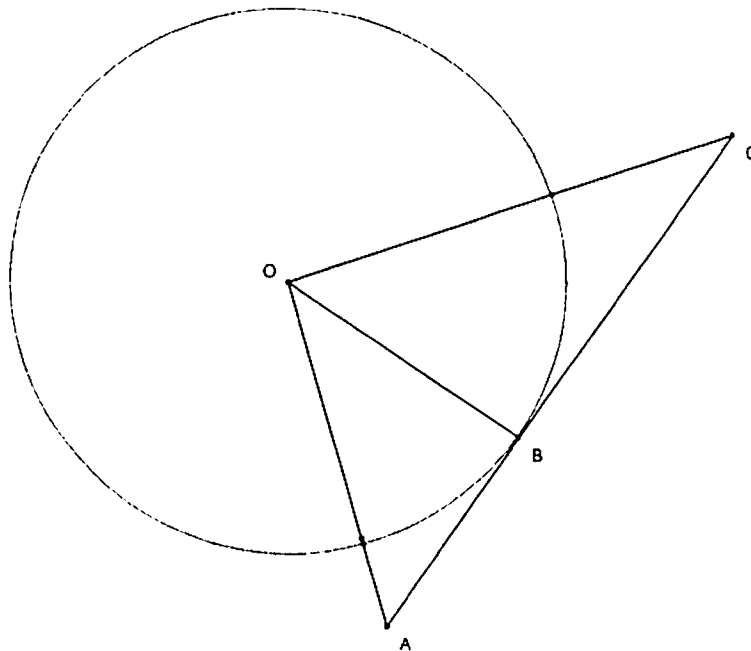
What do you notice about the measures of angles formed by the radius and the tangent line at the point of tangency?

(handout)

Applying Tangent Properties with Paper and Pencil

Problem No. 1

A tangent to a circle is perpendicular to the radius at the point of tangency. Given the diagram below and the tangent properties discussed in this workshop, outline a problem situation that requires the application of tangent properties to determine unknown measures.



Applying Tangent Properties with Paper and Pencil

Problem No. 2

Two circles are concentric and the centre of both is O . The radius of the smaller circle is 11 cm. The chord XY of the large circle is 30 cm and is also tangent to the smaller circle at W . Find the diameter and circumference of the larger circle to the nearest tenth of a centimeter.

