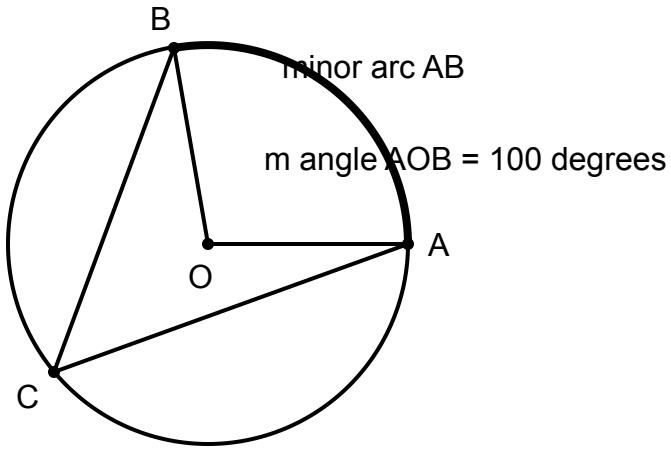
Angles and Their Intercepted Arcs

Use central and inscribed angles to find minor and major arcs

Name: _____ Date: _____

Part 1 - Central angle and minor arc

Circle facts: A central angle has its vertex at the center, and its measure equals its intercepted arc. An inscribed angle has its vertex on the circle and measures half of the intercepted arc. For an inscribed angle, use the arc between the endpoints that does *not* contain the vertex.



1. The bold arc AB is intercepted by both angles shown. Find each measure. Then explain why the two angles have different measures.

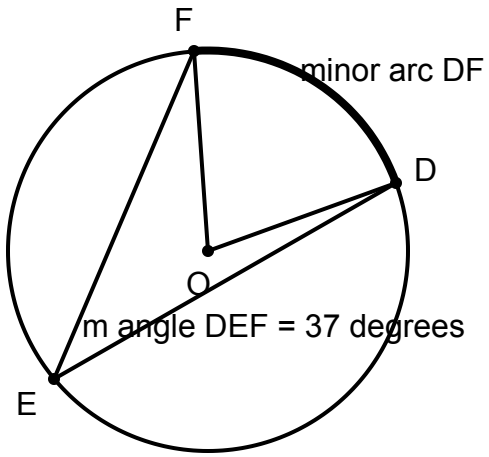
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Part 2 - Inscribed angle to central angle

2. Point E is on the circle. The inscribed angle DEF measures 37 degrees. The bold minor arc DF is the intercepted arc. Find the measure of minor arc DF and the measure of central angle DOF. Show an equation for each result.



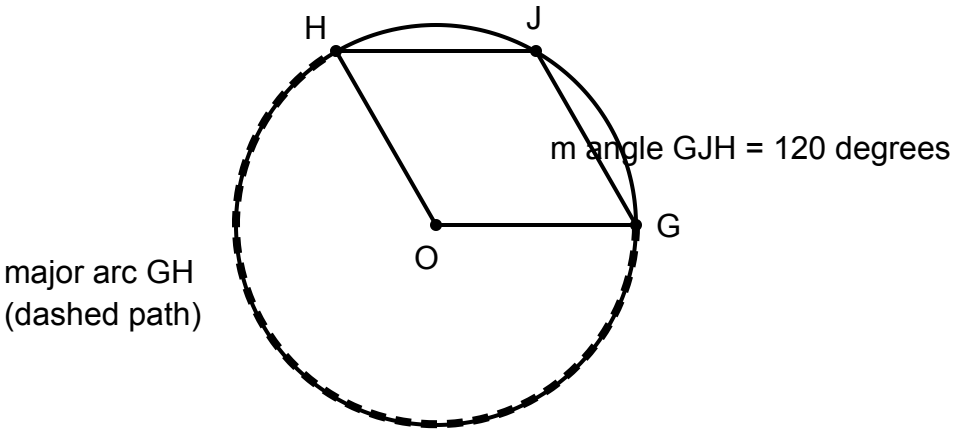
Angles and Their Intercepted Arcs

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Name: _____ Date: _____

Part 3 - Major arc and the other arc

3. Point J lies on the minor arc from G to H. Therefore, angle GJH intercepts the **major** arc GH, not the minor arc. Given m angle GJH = 120 degrees, find: (a) major arc GH, (b) minor arc GH, and (c) the smaller central angle GOH. Write equations and a sentence describing the relationship.



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Answer key - Angles and arcs

1. Minor arc AB = 100 degrees because central angle AOB and minor arc AB have equal measures. Inscribed angle ACB = 50 degrees because 100 / 2 = 50. Sample explanation: The central angle uses the center as its vertex, so it equals the arc. The inscribed angle has its vertex on the circle, so it is half the same intercepted arc.

2. Minor arc DF = 74 degrees: 2(37) = 74. Central angle DOF = 74 degrees because a central angle equals its intercepted minor arc.

3. (a) Major arc GH = 240 degrees: 2(120) = 240. (b) Minor arc GH = 120 degrees: 360 - 240 = 120. (c) Smaller central angle GOH = 120 degrees because it intercepts minor arc GH. Sample relationship sentence: An inscribed angle is half its intercepted major arc; the remaining minor arc has the same measure as the smaller central angle.

Diagram check: In Part 1, C is outside minor arc AB, so angle ACB intercepts minor arc AB. In Part 2, E is outside minor arc DF. In Part 3, J is on minor arc GH, so angle GJH intercepts the opposite major arc GH.

Angles and Their Intercepted Arcs

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Teaching notes and companion directions

Materials: Supplied student pages with three circle diagrams and answer lines; additionally needed: pencil and optional straightedge. Print and supply all student pages, keeping teacher-key pages separate.

Setup: Give each student the three Parts in order. Ask students to keep the diagram visible while writing each equation. Do not provide a protractor; the task assesses angle-arc relationships, not measuring from a drawing.

Teaching script: Say: “Trace the two rays of the angle to their endpoints on the circle. The intercepted arc is the arc between those endpoints. For an inscribed angle, make sure the arc you choose does not contain the angle’s vertex. A central angle equals its arc; an inscribed angle is half its arc.”

Observation method: Circulate and check whether each student (1) identifies the correct intercepted arc, (2) doubles an inscribed angle or halves an arc correctly, and (3) uses 360 degrees to connect a major arc and minor arc. Prompt only: “Does your chosen arc contain the vertex?” Record each criterion as secure, developing, or not yet.

Source credit: New York Next Generation Mathematics Learning Standards, GEO-G.C.2.a, “Identify, describe and apply relationships between the angles and their intercepted arcs of a circle.” https://lessonmakerpro.com/standards/ny-nextgen-math/geo-g-c-2-a