# A Circle Proof

A point on a circle connected to the endpoints of a diameter forms a right triangle

# Circle Properties

- tangent is perpendicular to radius at point of tangency.
- A point on a circle is connected to endpoints of a diameter, forming a right triangle.
- The central angle of an arc is double the inscribed angle of the same arc.

# Proof: Construction of a right triangle.

Given:

Circle O with a diameter AB and point P.

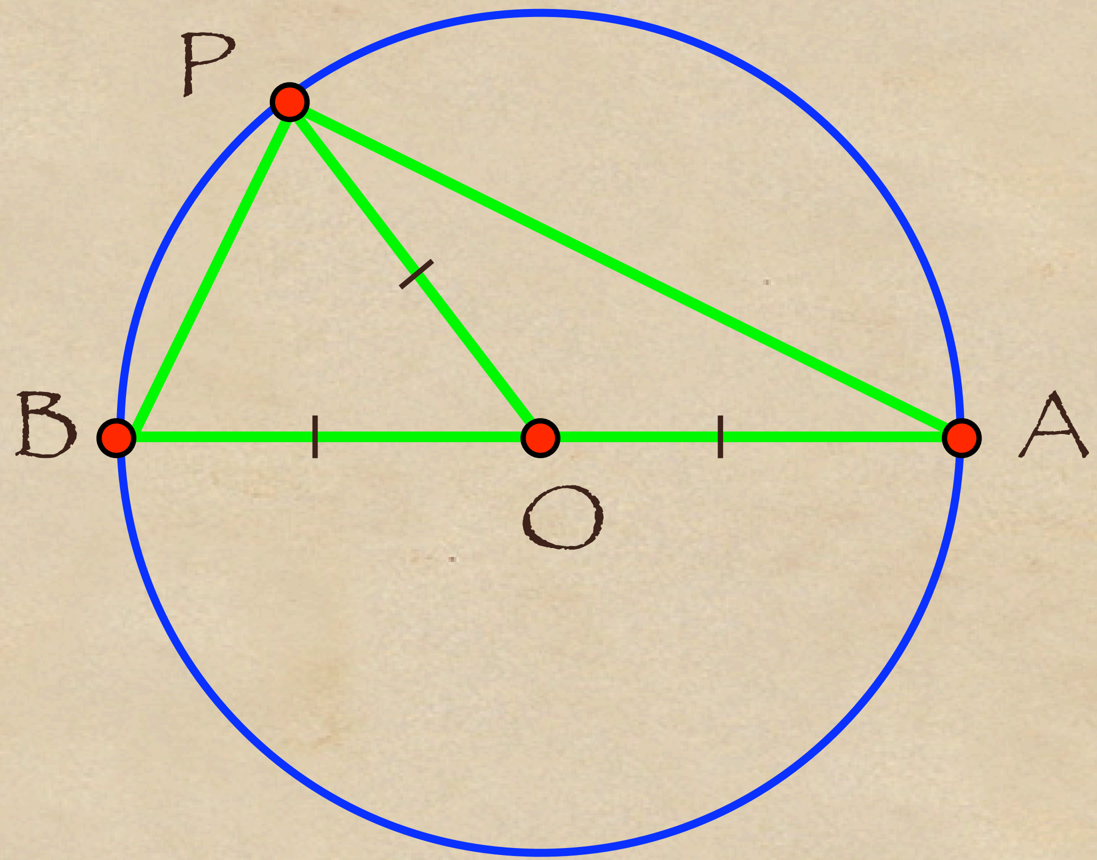
To Prove:

APB is a right angle.

There is an obvious line to be drawn, so we add OP.

OA, OP, and OB are radii of the circle and so are equal.

Triangles AOP and BOP are isosceles.



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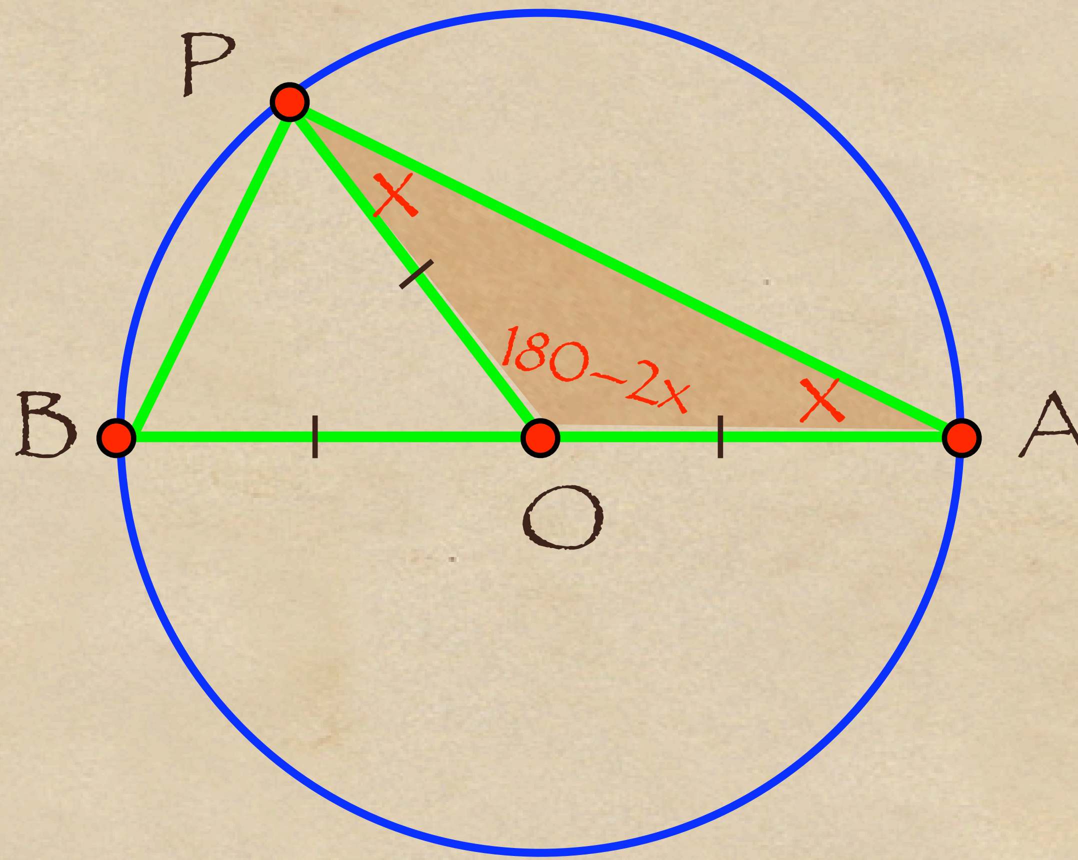


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Triangles AOP and BOP are isosceles.

We do not know what angle OAP is so we let it be **x**.

Since the triangle is isosceles, the other base angle is also **x**, making the third angle **180°–2x**.

We start by focusing on the one of the isosceles triangles.

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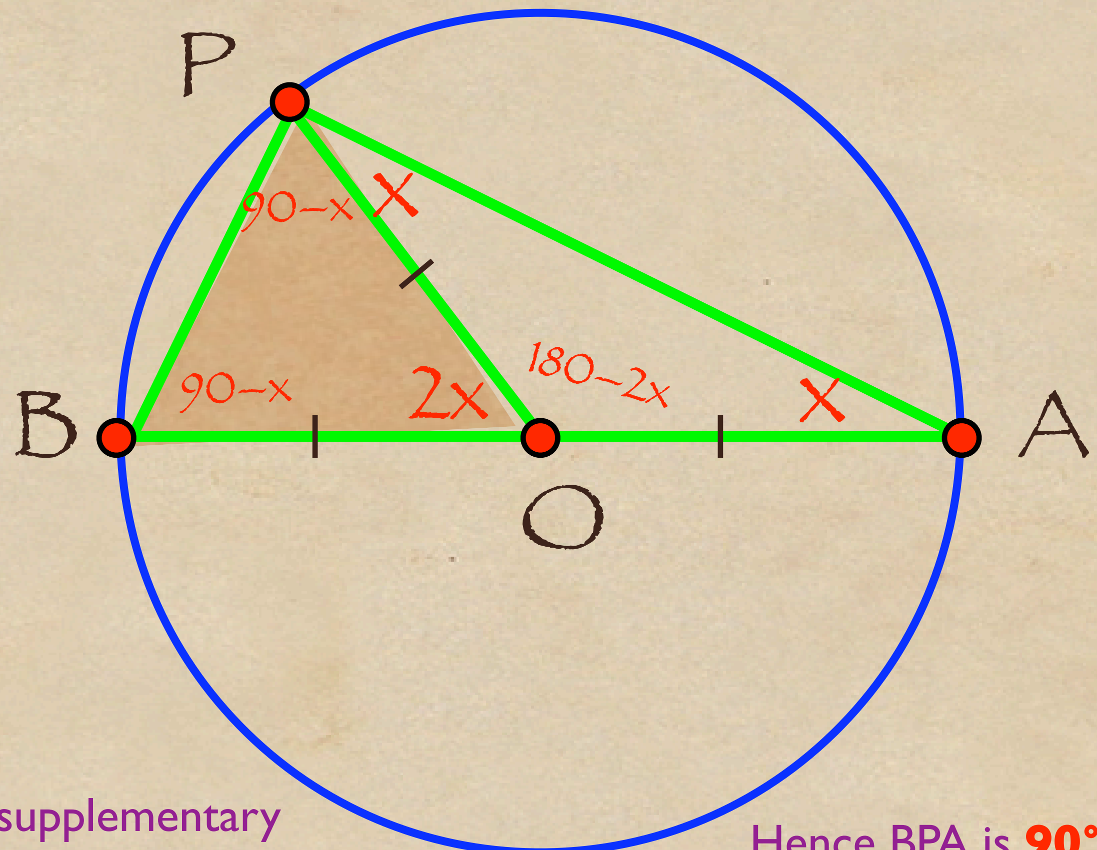


Since the triangle is isosceles, the other base angle is also **x**, making the third angle **180°–2x**.

BOP is supplementary to AOP and is **2x**, making the two base angles **90°–x**.

Hence BPA is **90°–x** plus **x** and is 90°, a right angle.

QED

Now we focus on the other isosceles triangle.

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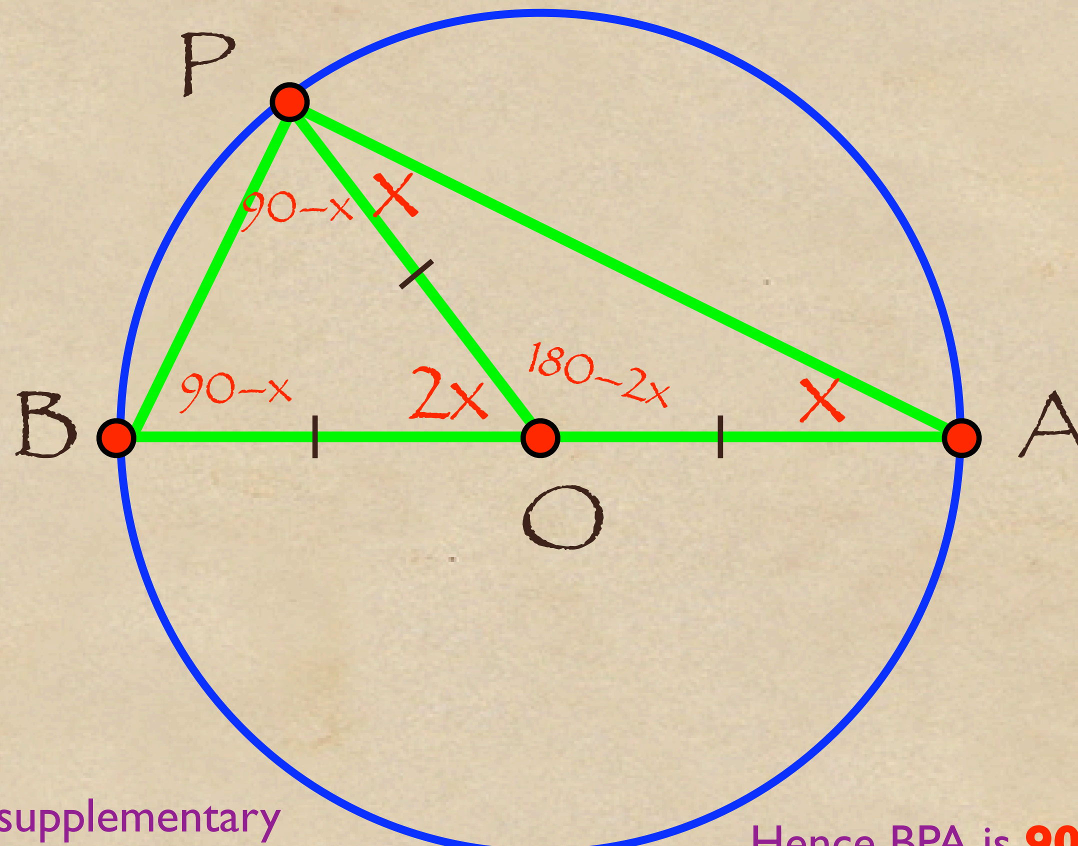


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