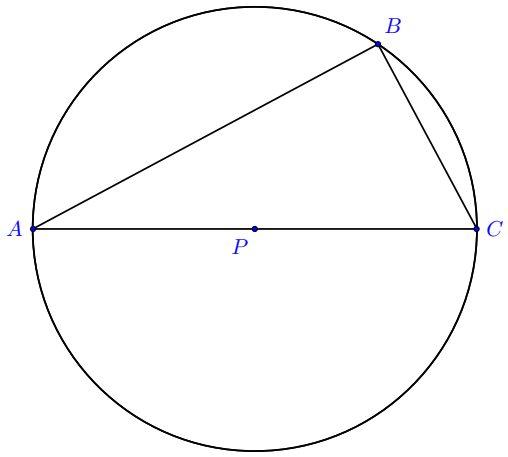
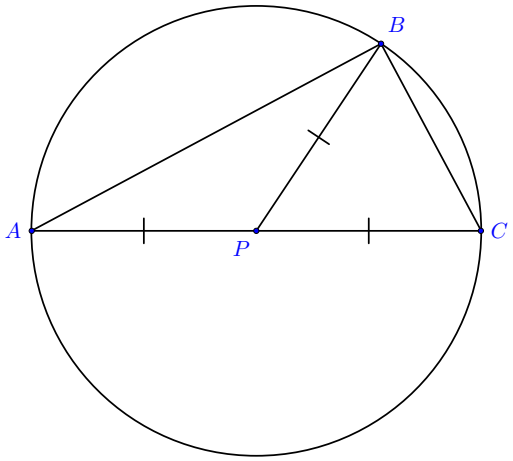
Inscribed Angles

Proofs.

Problem 1 *In the figure below, $\overline{AB}$ is a diameter of a circle with center P. Natalia is trying to prove that $\angle B$ is a right angle.*

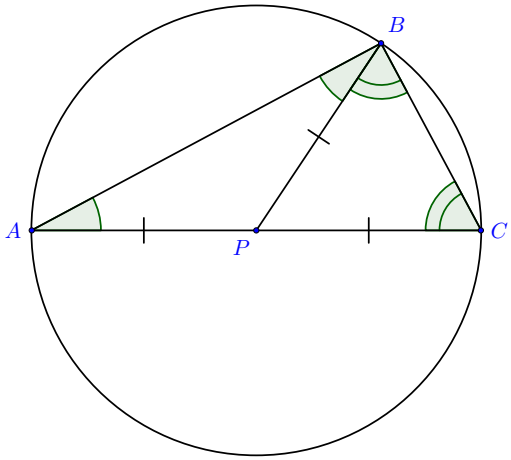


Natalia draws $\overline{PB}$ and marks the diagram to show segments that she knows to be congruent because each one is a $\boxed{\textit{radius}}$ *of the circle.*

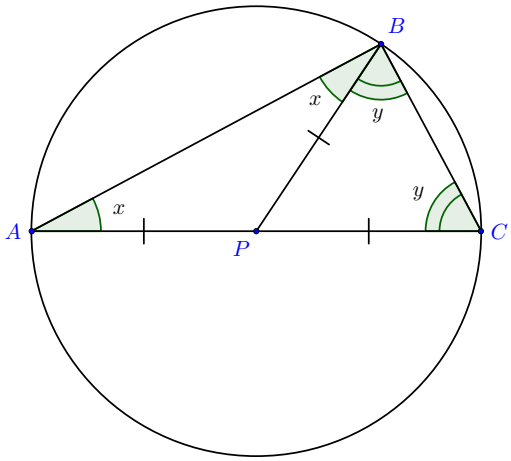


Author(s): Brad Findell

Natalia sees that $\triangle APB$ *and* $\triangle BPC$ *are* $\boxed{\textit{isosceles}}$ *triangles, so she marks the figure to show congruent angles.*



In order to do some algebra with these congruent angles, Natalia labels their measures x *and* y*, as shown in the following picture:*



She writes an equation for the sum of the angles of $\triangle ABC$*:*

$$\boxed{x + (x + y) + y} = 180^\circ$$

Since $m\angle B = \boxed{x + y}$*, she concludes that* $m\angle B = 90^\circ$*.*