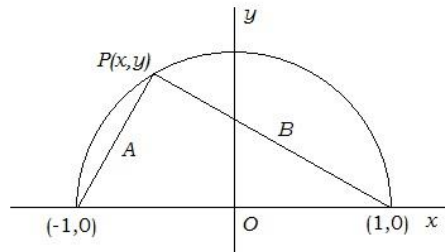


**Answer on Question#39217 – Math – Other**

Using coordinate geometry prove that angle in a semicircle is a right angle

**Solution:**

Consider the following diagram:



We have unit semicircle whose center is at the origin.

Point P is  $(x, y) = (x, \sqrt{1 - x^2})$

The slope of line segment A is:

$$m_a = \frac{\sqrt{1 - x^2} - 0}{x - (-1)} = \frac{\sqrt{1 - x^2}}{x + 1} = \sqrt{\frac{1 - x}{1 + x}}$$

The slope of line segment B is:

$$m_b = \frac{\sqrt{1 - x^2} - 0}{x - 1} = \frac{\sqrt{1 - x^2}}{1 - x} = -\sqrt{\frac{1 - x}{1 + x}}$$

Two lines are perpendicular if the product of their slopes is -1.

$$m_a \cdot m_b = \left( \sqrt{\frac{1 - x}{1 + x}} \right) \left( -\sqrt{\frac{1 - x}{1 + x}} \right) = -1$$

Thus, we know line segments A and B are perpendicular, and so the triangle is a right triangle.