

Area lying in the first quadrant and bounded by the circle $x^2 + y^2 = 4$ and the lines $x = 0$ and $x = 2$ is

A. π

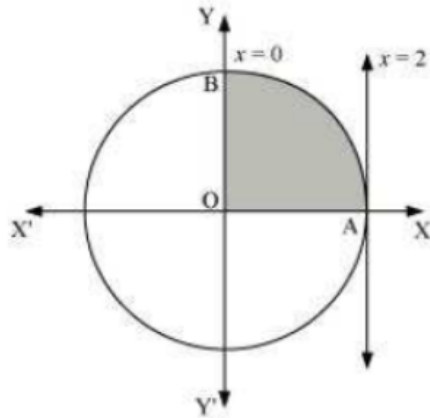
B. $\frac{\pi}{2}$

C. $\frac{\pi}{3}$

D. $\frac{\pi}{4}$

solution:

The area bounded by the circle and the lines, $x = 0$ and $x = 2$, in the first quadrant is represented as



$$\begin{aligned}\therefore \text{Area OAB} &= \int_0^2 y \, dx \\ &= \int_0^2 \sqrt{4-x^2} \, dx \\ &= \left[\frac{x}{2} \sqrt{4-x^2} + \frac{4}{2} \sin^{-1} \frac{x}{2} \right]_0^2 \\ &= 2 \left(\frac{\pi}{2} \right) \\ &= \pi \text{ units}\end{aligned}$$

Thus, the correct answer is A.