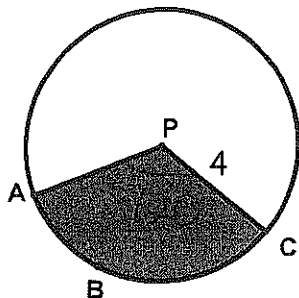


Geometry Notes - Arc Length and Areas of Sectors and Segments of Circles

Arc length = $\frac{m}{360} C$ where m is the measure of the central angle and C is the circumference.

Area of sector = $\frac{m}{360} \pi r^2$ where m is the measure of the central angle and r is the radius of the circle.

Example 1: Given: $\square P$ and $m\angle APC = 120^\circ$



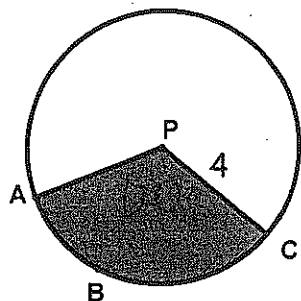
a. Find the length of \widehat{ABC}

$$\text{Arc length} = \frac{1}{3} \frac{120}{360} \pi (8)$$

$$\text{Arc length} = \frac{1}{3} (8\pi)$$

$$\text{Arc length} = \frac{8\pi}{3} \text{ units}$$

Given: $\square P$ and $m\angle APC = 120^\circ$



b. Find the area of the shaded sector.

$$A_{\text{sector}} = \frac{1}{3} \frac{120}{360} \pi r^2$$

$$A_{\text{sector}} = \frac{1}{3} \pi 4^2$$

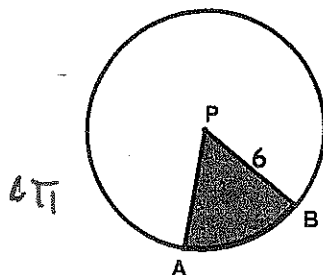
$$A_{\text{sector}} = \frac{16\pi}{3} \text{ units}^2$$

Example 2:

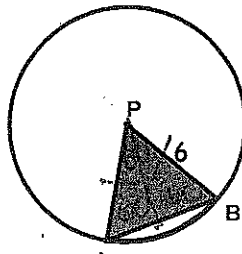
Circle

Given: $\square P$ and $m\angle APB = 60^\circ$

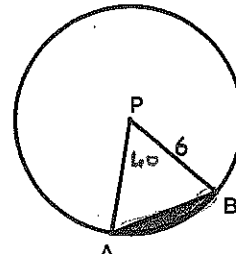
Note: Sector of Circle - Triangle = Segment of Circle



$$\frac{60}{360} \pi 6^2$$



$$\frac{52\sqrt{3}}{4} = 13\sqrt{3}$$



$$6\pi - 9\sqrt{3} \text{ units}^2$$

$$\frac{52\sqrt{3}}{4} \leftarrow \text{Area of } \triangle APB$$