

### Answer on Question #44710-Physics-Electromagnetism

A straight wire of magnetic moment  $M$  is moulded in an arc of radius  $R$  and angle  $90^\circ$  then magnetic moment becomes.

#### Solution

If the magnet is bent at an angle  $\theta$  in the form of arc then

$$M' = \frac{2M \sin \frac{\theta}{2}}{\theta}.$$

$$\text{As } \theta = \frac{\pi}{2}$$

$$M' = \frac{2M \sin \frac{\pi}{4}}{\frac{\pi}{2}} = \frac{2M \cdot \frac{\sqrt{2}}{2}}{\frac{\pi}{2}} = \frac{2\sqrt{2}M}{\pi}.$$

$$\text{Answer: } \frac{2\sqrt{2}M}{\pi}.$$