*Answer on Question #77140 – Math – Geometry*

## *Question*

A semicircular sheet of metal of diameter 28cm is bent into an open conical cup. What is the approximate depth of the curve?

## *Solution*

$D = 28cm \Rightarrow r = \frac{1}{2}D = \frac{1}{2}28 = 14cm.$

$$\text{Circumference of semicircle } = \pi * \text{r} \Rightarrow \text{circumference of semicircle } =$$

$$= \frac{22}{7} * 14 = 44 \text{ cm}.$$

Circumference of base of cone = circumference of semicircle :

$$2\pi R = 44$$

$$R = \frac{44}{2\pi} = \frac{44}{2 * \frac{22}{7}} = \frac{44 * 7}{44} = 7cm.$$

By the Pythagorean Theorem:

$$(\text{radius of the semicircular sheet})^2 = (\text{depth of the curve})^2 + R^2$$

$$14^2 = (\text{depth of the curve})^2 + 7^2$$

$$196 = (\text{depth of the curve})^2 + 49$$

$$(\text{depth of the curve})^2 = 147$$

$$\text{depth of the curve} = \sqrt{147} = 7\sqrt{3} \approx 12.12cm$$

**Answer:** $12.12cm.$