

January 24th

A hollow cylinder may be formed from a 8cm by 15cm sheet in two ways.

Version 1: Circumference of the top = 8cm, Height = 15cm

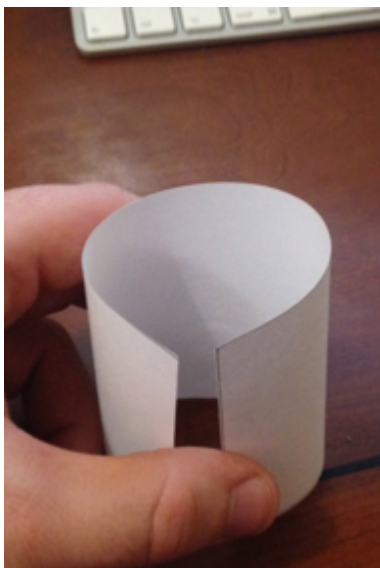


$$\text{Circumference} = 2\pi \times r$$

$$\text{Hence Radius} = \frac{C}{2\pi} = \frac{8}{2\pi} = \frac{4}{\pi}$$

$$\text{Volume} = \pi r^2 h = \pi \times \left(\frac{4}{\pi}\right)^2 \times 15$$

$$\text{Therefore } V = \frac{240}{\pi}$$



Version 2:

Circumference of the top = 15cm, Height = 8cm

$$\text{Circumference} = 2\pi \times r$$

$$\text{Hence Radius} = \frac{C}{2\pi} = \frac{15}{2\pi}$$

$$\text{Volume} = \pi r^2 h = \pi \times \left(\frac{15}{2\pi}\right)^2 \times 8$$

$$\text{Therefore } V = \frac{450}{\pi}$$

$$\text{Hence the difference in volumes} = \frac{450 - 240}{\pi} = \frac{210}{\pi} \approx \mathbf{66.8\text{cm}^3}$$