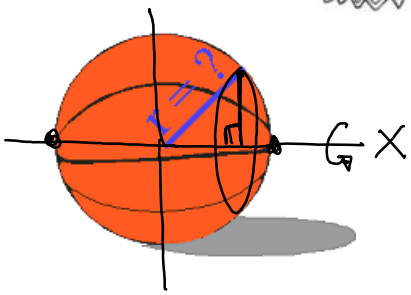
Thursday, March 16, 2016

- ✧ Opener - below
- ✧ Volumes of Revolution - continued

Opener: (Calculator OK for Arithmetic)

A basketball (radius 9.5 inches) is created by placing a semicircle (r = 9.5 in) on the x-axis (center at (0,0)) and rotating it around the x-axis. Find the volume of the basketball using calculus, and compare it to the volume using V = 4/3πr^3.



$$A_{disk} = (90.25 - x^2)\pi$$

$$x^2 + r^2 = 9.5^2$$

$$r = \sqrt{90.25 - x^2}$$

$$V = \int_{-9.5}^{9.5} \pi(90.25 - x^2)\,dx$$

$$\approx 3591.364 \text{ in}^3$$

$$V_{sphere} = \frac{4}{3}\pi(9.5)^3$$

$$\approx 3591.364 \text{ in}^3$$