

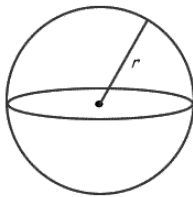
Task:

A sphere has a diameter of 4.320 meters. How many meters long is "Unit Y" if the surface of the sphere, measured in square Units Y is equal to the volume of the sphere measured in cube Units Y.

Solution:

Sphere

$$\frac{\text{Surface Area}}{\text{Area}} \quad A = 4 \pi r^2$$



$$\frac{\text{Volume}}{\text{Volume}} \quad V = \frac{4}{3} \pi r^3$$

$$2r = 4.32 \text{ m}$$

$$4\pi r^2 = 58.630 \text{ m}^2 = X (\text{Unit Y})^2$$

$$\frac{4}{3}\pi r^3 = 42.213 \text{ m}^3 = X (\text{Unit Y})^3$$

$$\text{Unit Y} = \left(\frac{58.630 \text{ m}^2}{X} \right)^{\frac{1}{2}}$$

$$\text{Unit Y} = \left(\frac{42.213 \text{ m}^3}{X} \right)^{\frac{1}{3}}$$

$$\left(\frac{58.630 \text{ m}^2}{X} \right)^{\frac{1}{2}} = \left(\frac{42.213 \text{ m}^3}{X} \right)^{\frac{1}{3}}$$

$$\frac{(58.630)^{\frac{1}{2}}}{(X)^{\frac{1}{2}}} = \frac{(42.213)^{\frac{1}{3}}}{(X)^{\frac{1}{3}}}$$

$$(42.213)^{\frac{1}{3}} \cdot (X)^{\frac{1}{2}} = (58.630)^{\frac{1}{2}} \cdot (X)^{\frac{1}{3}}$$

$$(X)^{\frac{1}{6}} = \frac{(58.630)^{\frac{1}{2}}}{(42.213)^{\frac{1}{3}}}$$

$$X = \left(\frac{(58.630)^{\frac{1}{2}}}{(42.213)^{\frac{1}{3}}} \right)^6 = \frac{58.630^3}{42.213^2} = 113.101$$

Answer:

$$X = 113.101$$