

### DATA:

mass: rectangular prism = 42.6g

hollowed cylinder = 103.4g

sphere = 44.6g

cylinder = 16.4g

dimensions: rectangular prism = length: 7.5cm

width: 1.2cm

height: 4.8cm

hollow cylinder = diameter: 1.9cm

length: 6.2cm

center length: 4.9cm

inside: 0.5cm

Sphere = diameter: 2.2cm

Cylinder = height: 2.2cm

diameter: 1.1cm

### Calculations:

rectangular prism:

$$SA = 2((l \times w) + (l \times h) + (w \times h))$$

$$V = l \times w \times h$$

$$\rho = m/V$$

$$SA = 2((4.9\text{cm} \times 1.2\text{cm}) + (4.8\text{cm} \times 7.5\text{cm}) + (7.5\text{cm} \times 1.2\text{cm}))$$

$$SA = 41.52\text{cm}^2$$

$$V = (4.9\text{cm})(7.5\text{cm})(1.2\text{cm})$$

$$V = 14.4\text{cm}^3$$

$$\rho = \frac{42.6\text{g}}{14.4\text{cm}^3} = \rho = 2.958\text{g/cm}^3$$



Calculations Continued:

Sphere:  $SA = 4\pi (1.1\text{cm})^2 = 15.21\text{cm}^2$

$$V = \frac{4}{3}\pi (1.1\text{cm})^3 = 5.58\text{cm}^3$$

$$\rho = \frac{44.6\text{g}}{5.58\text{cm}^3} = 8.0\text{g/cm}^3$$

cylinder:  $V = \pi (.95\text{cm})^2 (2.2\text{cm}) = 2.09\text{cm}^3$

$$SA = 2\pi (.55\text{cm})^2 + 2\pi (.55\text{cm})(2.2\text{cm}) = 9.50\text{cm}^2$$

$$\rho = 16.4\text{g} / 2.09\text{cm}^3 = 7.85\text{g/cm}^3$$

hollow cylinder:

large:  $V = \pi (0.95\text{cm})^2 (6.2\text{cm}) = 17.58\text{cm}^3$

$$SA = 2\pi (0.95\text{cm})^2 + 2\pi (0.95\text{cm})(6.2) = 42.68\text{cm}^2$$

$$\rho = 103.4\text{g} / 17.58\text{cm}^3 = 5.88\text{g/cm}^3$$

small:  $V = \pi (0.5\text{cm})^2 (4.9\text{cm}) = 3.85\text{cm}^3$

$$SA = 2\pi (0.5\text{cm})^2 + 2\pi (0.5\text{cm})(4.9\text{cm}) = 16.96\text{cm}^2$$

$$\rho = 103.4\text{g} / 13.73\text{cm}^3 = 7.53\text{g/cm}^3$$

$$V = 17.58\text{cm}^3 - 3.85\text{cm}^3 = 13.73\text{cm}^3$$

$$SA = (42.68 + 16.96) - 1 = 58.64\text{cm}^2$$

$$\rho = 7.53\text{g/cm}^3$$



4 mm:

rectangle:

$$\sigma SA = 1.01 \text{ cm}^2$$

$$\sigma V = .68 \text{ cm}^3$$

cylinder:

$$\sigma SA = .15 \text{ cm}^2$$

$$\sigma V = .38 \text{ cm}^3$$

sphere:

$$\sigma SA = 0.44 \text{ cm}^2$$

$$\sigma V = 0.76 \text{ cm}^3$$

hollow cylinder:

$$\sigma SA = 0.26 \text{ cm}^2$$

$$\sigma V = 2.00 \text{ cm}^3$$