

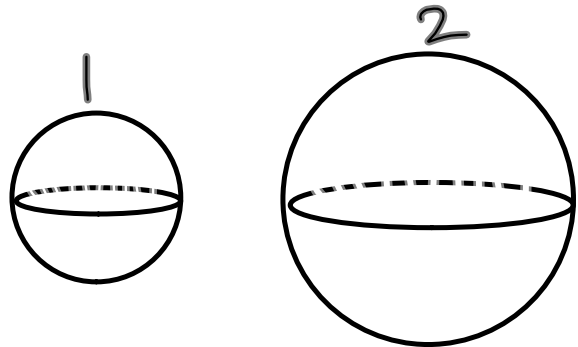
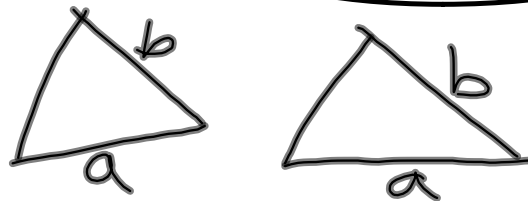
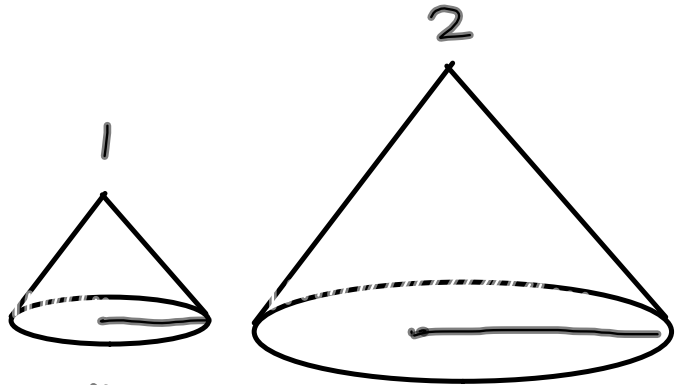
Two similar cones where

$$\frac{\text{height cone 1}}{\text{height cone 2}} = \frac{2}{3}$$

- a) What is the ratio of their radii?  $\frac{2}{3}$
- b) What is the ratio of their slant heights?  $\frac{2}{3}$
- c) What is the ratio of their lateral areas?
- d) What is the ratio of their volumes?

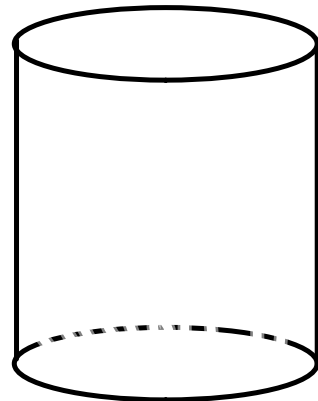
$$\left(\frac{2}{3}\right)^2 = \frac{4}{9} \text{ cm}^2$$

$$\left(\frac{2}{3}\right)^3 = \frac{8}{27}$$



The circumference of sphere 1 is  $\frac{1}{3}$  that of sphere 2. What is the ratio of the areas?

$$\left(\frac{1}{3}\right)^2$$



7. a) Volume of pyramid =  $\frac{A_b \times h}{3} = 400 \text{ cm}^3$   
 scale factor =  $\frac{1}{2}$  for <sup>3</sup> volume:  $k^3 = \left(\frac{1}{2}\right)^3 = \frac{1}{8}$   
 $\frac{1}{8} \times 400 \text{ cm}^3 = \boxed{50 \text{ cm}^3}$

b) SA of cylinder =  $2\pi r h + 2\pi r^2 = 250\pi \text{ m}^2$   
 scale factor =  $\boxed{2}$  for area:  $k^2 = 2^2 = 4$   
 $4 \times 250\pi \text{ m}^2 = \boxed{1000\pi \text{ m}^2}$

c) SA of sphere =  $2304\pi \text{ dm}^2$   
 scale factor = 3 for area:  $k^2 = 3^2 = 9$   
 $9 \times 2304\pi \text{ dm}^2 = \boxed{20736\pi \text{ dm}^2}$

8. Vol cube = Vol pyramid  
 $6^3 = \frac{A_b \times h}{3} \Rightarrow \frac{6^3}{1} = \frac{A_b \times 8.64}{3}$

•  $3(6^3) = A_b \times 8.64$

square base =  $x^2$

$$\frac{648}{8.64} = \frac{8.64 x^2}{8.64}$$

$x^2 = 75$

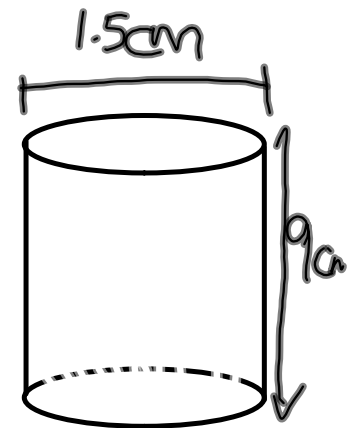
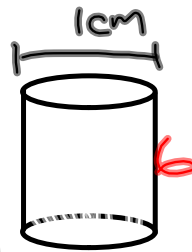
$x = \sqrt{75} \approx 8.66$

## Finding Surface Area/Volume in Similar Solids

1. Find the scale factor (ratio of similarity),  $k = \frac{\text{measure of one side}}{\text{measure of matching side}}$
2. For surface area, use  $k^2$ . For volume, use  $k^3$
3. Multiply/divide the given number to find the unknown.

e.g. p. 45, #16

Given that these two cylinders are similar, find the volume of the smaller cylinder.



$$\frac{1.5}{1} \text{ OR } \frac{1}{1.5} \left( \frac{2}{3} \right)$$

$$\left( \frac{2}{3} \right)^3 = \frac{8}{27}$$

$$\frac{1}{1.5} = \frac{x}{9}$$

$$x = 6$$

$$\frac{2}{3} \pi$$

$$\pi r^2 h$$

$$\pi \left( \frac{1.5}{2} \right)^2 9$$

$$\pi (0.75)^2 9$$

p.46, #20. a)

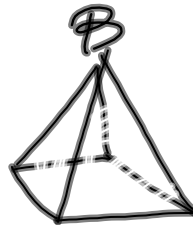
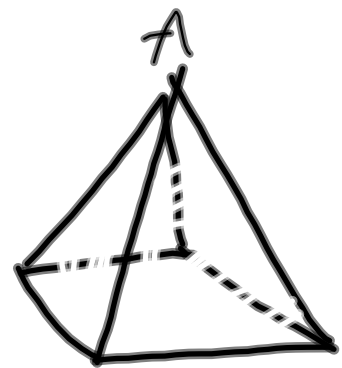
What is the height of regular square pyramid A?

$$\sqrt{\left(\frac{3.24}{5.29}\right)} = k$$

$$0.78 = k$$

$$2.6 \div (0.78) = 3.\bar{3} \text{ cm}$$

slant height: 2.6 cm

Area of base =  $3.24\text{cm}^2$ Area of the base =  $5.29\text{cm}^2$