

Notes for volume and surface area of a cone.

A cone is just a pyramid with a circular base.

So, finding the volume and surface area works the same way.

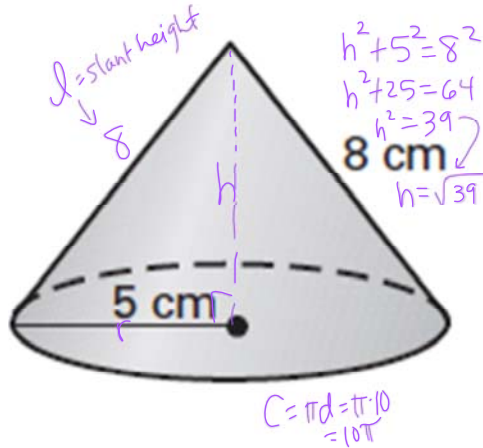
What is the formula for finding the "perimeter" of the base of a cone?

$$C = \pi d \text{ or } C = 2\pi r$$

What is the formula for finding the area of the base of a cone?

$$A = B = \pi r^2$$

Example 1: Find the volume and surface area of the following.



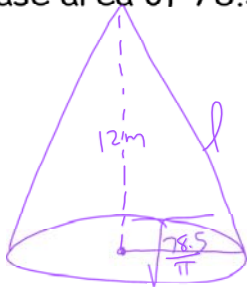
$$B = \pi r^2 = \pi \cdot 5^2 = 25\pi \approx 78.5 \text{ cm}^2$$

$$LA = \frac{1}{2} p l \text{ or } \frac{1}{2} C l = \frac{1}{2} (10\pi) 8 = 40\pi \approx 125.7 \text{ cm}^2$$

$$V = \frac{1}{3} B h = \frac{1}{3} (25\pi) (\sqrt{39}) \approx 163.5 \text{ cm}^3$$

$$SA = B + LA = 25\pi + 40\pi \approx 204.2 \text{ cm}^2$$

Example 2: Find the volume and surface area of a cone with the base area of 78.5 m<sup>2</sup> and a height of 12 m.



$$B = 78.5 \text{ m}^2$$

$$LA = \frac{1}{2} C \cdot l = \frac{1}{2} \cdot 2\pi(4.9987) \cdot 12.9995$$

$$LA \approx 204.1 \text{ m}^2$$

$$A = \pi r^2$$

$$78.5 = \pi r^2$$

$$\sqrt{\frac{78.5}{\pi}} = \sqrt{r^2}$$

$$r = \sqrt{\frac{78.5}{\pi}}$$

$$r \approx 4.9987$$

$$C = 2\pi(4.9987)$$

$$l^2 = 12^2 + 4.9987^2$$

$$l^2 = 168.9873$$

$$l \approx 12.9995$$

$$V = \frac{1}{3} B h = \frac{1}{3} (78.5) (12) = 314 \text{ m}^3$$

$$SA = B + LA = 78.5 + 204.1$$

$$SA \approx 282.6 \text{ m}^2$$