

Key

Examples: Basic Surface Area & Volume of Cylinders, Cones, and Spheres

Cylinders:

Surface Area:

$$SA = 2\pi r^2 + 2\pi rh$$

Formula!

Lateral Area:

$$LA = 2\pi rh$$

NO BASES!

Volume:

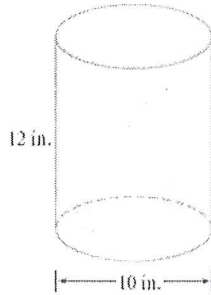
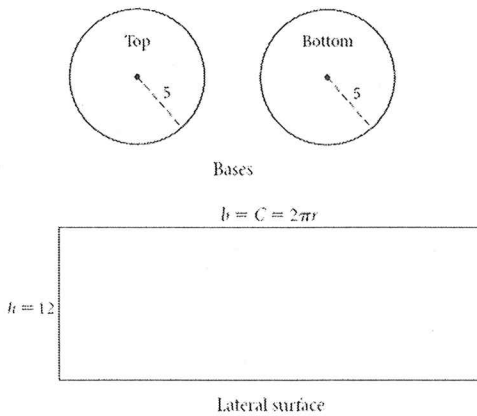
$$V = BH$$

B = AREA of BASE $B = \pi r^2$

H = Height connecting two bases.

Cylinder Example 1:

Find the surface area and volume of the ~~prism~~ cylinder. Keep in terms of pi and round to the nearest thousandth.



Cylinder

$$SA = 2\pi 5^2 + 2\pi 5 \cdot 12$$

$$= 50\pi + 120\pi$$

$$SA = 170\pi \text{ in}^2$$

$$V = \pi r^2 \cdot H$$

$$V = \pi 5^2 \cdot 12$$

$$V = 300\pi \text{ in}^3$$

$$SA = \underline{170\pi \text{ in}^2}$$

$$V = \underline{300\pi \text{ in}^3}$$

Cones:

Surface Area:

$$SA = \pi r^2 + \pi r l$$

Lateral Area:

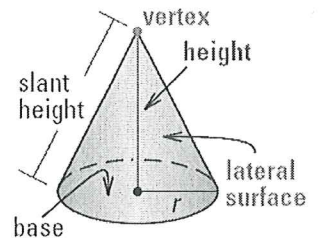
$$LA = \pi r l$$

Volume:

$$V = \frac{1}{3} BH$$

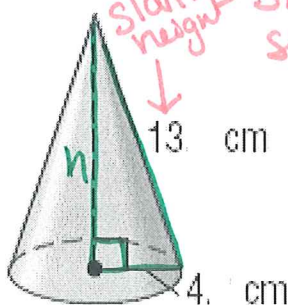
B = AREA of BASE $B = \pi r^2$

H = Height perpendicular to the base.



Find the volume and surface area of the solid. Keep in terms of pi and round to the nearest thousandth.

Cone Example 2:



$$SA = \pi r^2 + \pi r l$$

$$SA = \pi 4^2 + \pi 4 \cdot 13$$

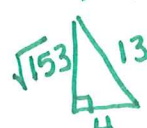
$$SA = 16\pi + 52\pi$$

$$SA = 68\pi$$

$$V = \frac{1}{3} \pi r^2 \cdot h$$

$$V = \frac{1}{3} \pi \cdot 16 \cdot \sqrt{153}$$

We don't know this so we have to find it.

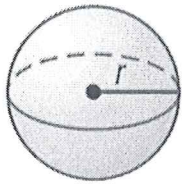


$$SA = \underline{68\pi \text{ cm}^2}$$

$$V = \underline{207.2498}$$

$$\text{Just Round this one: } \underline{207.250 \text{ cm}^3}$$

Spheres



Surface Area:

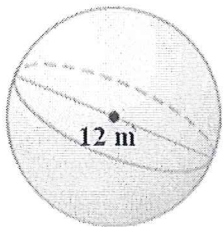
$$SA = 4\pi r^2$$

Volume:

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

Find the volume and surface area of the sphere. Keep in terms of pi.

Sphere Example 3:



$d = 12m$
 $r = 6$

$SA = 4\pi 6^2$
 $SA = 4\pi 36$

$SA = \underline{144\pi m^2}$

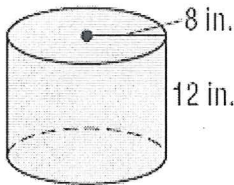
$V = \frac{4}{3}\pi 6^3$

$V = \underline{288\pi m^3}$

In Class Practice:

Directions: Identify each figure, find the surface area and volume of the following figures. You must write the formula you used first. Keep all answers in terms of pi, then show the rounded value to the nearest thousandth.

1.



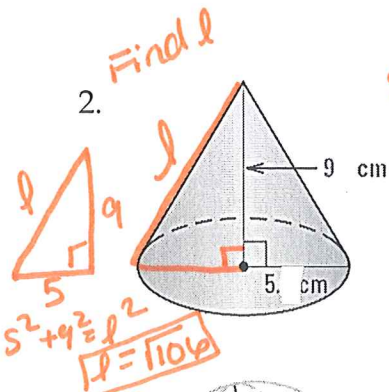
$SA = 2\pi r^2 + 2\pi r h$
 $SA = 2\pi 8^2 + 2\pi 8 \cdot 12$
 $SA = 128\pi + 192\pi$
 $SA = 320\pi$
 $V = \pi r^2 \cdot h$ $V = \pi 8^2 \cdot 12$

Identify: Cylinder

Surface Area: $320\pi in^2$

Volume: $972\pi in^3$

2.



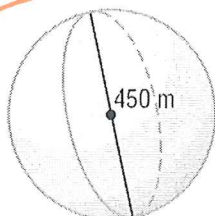
$SA = \pi r^2 + \pi r l$
 $SA = \pi 5^2 + \pi 5 \cdot \sqrt{106}$
 $V = \frac{1}{3}\pi 5^2 \cdot 9$

Identify: Cone

Surface Area: $240.263 cm^2$

Volume: $75\pi cm^3$

3.



$SA = 4\pi r^2$
 $SA = 4\pi 225^2$
 $SA = 202500\pi$
 $V = \frac{4}{3}\pi 225^3$
Huge!

Identify: Sphere

Surface Area: $202500\pi m^2$

Volume: $15187500\pi m^3$