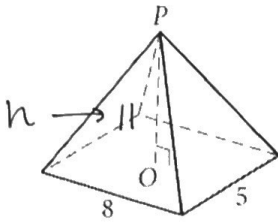


Volume and Density Review

1. Find the volume of the figures below. Leave answers in terms of pi. Include units!!!

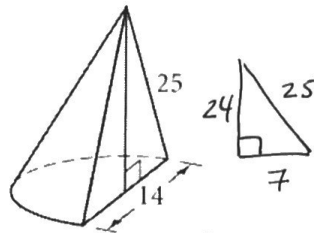
a.



$$V = \frac{1}{3}(8)(8)(11)$$

$$\frac{440}{3}$$

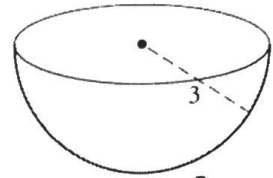
b.



$$\frac{1}{3}\pi(7)^2(24)$$

$$\frac{392\pi}{2} = 196\pi$$

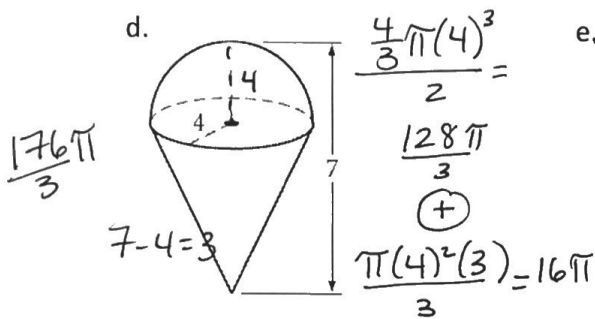
c.



$$\frac{4}{3}\pi(3)^3 = \frac{36\pi}{2}$$

$$18\pi$$

d.



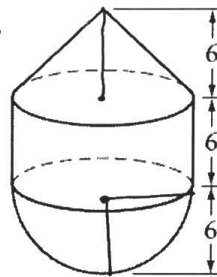
$$\frac{176\pi}{3}$$

$$\frac{4}{3}\pi(4)^3 = \frac{128\pi}{3}$$

$$+$$

$$\pi(4)^2(3) = 16\pi$$

e.



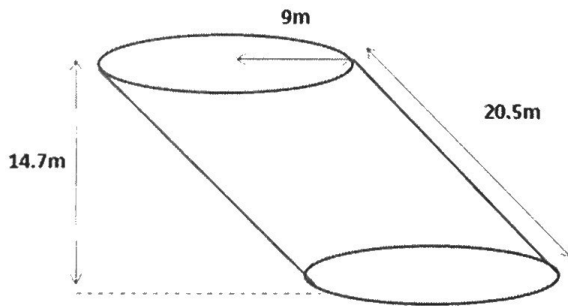
$$\frac{1}{3}\pi(6)^2(6) = 72\pi$$

$$\pi(6)^2(6) = 216\pi$$

$$\frac{4}{3}\pi(6)^3 = \frac{288\pi}{3}$$

$$576\pi$$

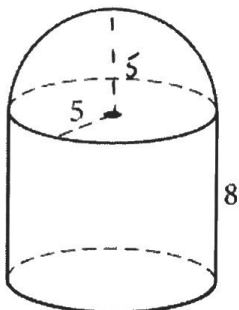
2. Use Cavalier's Principle to find the volume of the cylinder below. Include units! Round to the nearest hundredth.



$$V = \pi(9)^2(14.7)$$

$$\approx 3740.69 \text{ m}^3$$

3. A Silo hold water. Find how much water can fit inside the Silo. Round to the nearest hundredth.

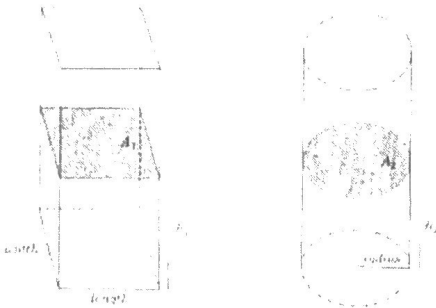


$$V = \frac{4}{3}\pi(5)^3 = \frac{250\pi}{3}$$

$$V = \pi(5)^2(8) = 200\pi$$

$$\frac{850\pi}{3}$$

4. Based on Cavalier's Principle, what can we conclude about the volume of the two figures below?
- $A_1 = A_2$
 - Height of the rectangular prism = height of the cylinder



Conclusion about the volumes:

They have the same volume!

5. If the volume of a sphere is 635 cm^3 , what is the length of the radius? Round to the nearest hundredth.

$$\frac{635}{\frac{4}{3}\pi} = \frac{\frac{4}{3}\pi r^3}{\frac{4}{3}\pi}$$

$$r^3 = 151.595$$

$$r \approx 5.33 \text{ cm}$$

6. A sphere has volume $221.83\pi \text{ cm}^3$. What is its diameter? Round to the nearest hundredth

$$\frac{221.83\pi}{\frac{4}{3}\pi} = \frac{\frac{4}{3}\pi r^3}{\frac{4}{3}\pi}$$

$$r^3 = 166.3725$$

$$r \approx 5.499 \approx 5.50 \text{ cm} \times 2 = 11 \text{ cm}$$

7. A cone has volume 320 cm^3 and height 16 cm . Find the radius of the base. Round your answer to the nearest 0.1 cm .

$$320 = \frac{\pi r^2 (16)}{3}$$

$$r^2 = 19.10$$

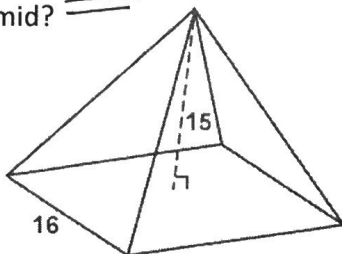
$$r \approx 4.37 \text{ cm} \approx 4.4 \text{ cm}$$

8. In Dingwall the town engineers have contracted for a new water storage tank. The tank is cylindrical with a base 25 ft in diameter and a height of 30 ft . What is the volume of the storage tank? Round to the nearest hundredth. $r = 12.5$

$$V = \pi (12.5)^2 (30)$$

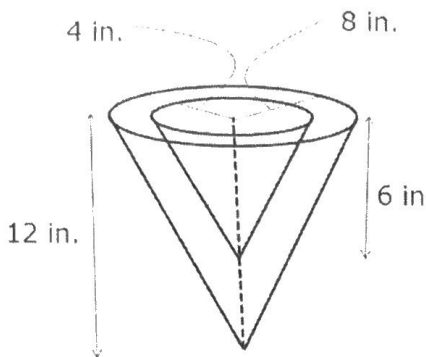
$$14726.22 \text{ ft}^3$$

9. The right square pyramid has a base edge of 16 in and a height of 15 in . What is the volume of the pyramid?



$$V = \frac{(16)(16)(15)}{3} = \frac{3840}{3} = 1280 \text{ in}^3$$

10. What is the volume of the cone when the inner cone is removed? Leave answers in terms of pi.



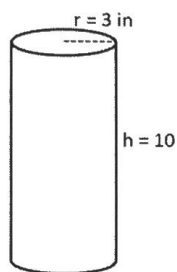
Big-Small

$$V = \frac{1}{3} \pi (8)^2 (12) = 256\pi$$

$$V = \frac{1}{3} \pi (4)^2 (6) = 32\pi$$

$$> 224\pi \text{ in}^3$$

11. What is the volume of the cylinder if the radius is tripled?



$$V = \pi (3r)^2 h$$

$$\pi (3 \cdot 3)^2 (10) = 90\pi \text{ in}^3$$

12. A block of aluminum occupies a volume of 15.0 mL and weighs 40.5 g. What is its density?

$$D = \frac{40.5}{15} = 2.7 \text{ g/mL}$$

13. If the density of a diamond is 3.5 g/cm³, what would be the mass of a diamond whose volume is .5 cm³?

$$3.5 = \frac{m}{.5} = 1.75 \text{ g}$$

14. If a 96.5g piece of aluminum has a density of 2.7 g/cm³, what is its volume?

$$2.7 = \frac{96.5}{V} \quad 35.74 \text{ cm}^3$$

15. On October 16, the beginning of squirrel-hunting season, biologists counted 75 gray squirrels in a 30 hectare woods. On December 15, 42 gray squirrels were counted in the same woods.

a. What was the density of the squirrel population on Oct.16? $\frac{75}{30} = 2.5 \text{ squirrels/acre}$

b. What was the density of the squirrel population on Dec.15? $\frac{42}{30} = 1.4 \text{ squirrels/acre}$