Ch 11 Rev Wk

Wednesday, April 7, 2021   11:49 AM

Use exact answers for all problems, unless otherwise indicated.

1) Find the volume.

base

$V = Bh$

$= \frac{1}{2}(bh)(h)$

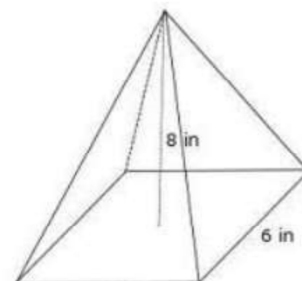$= \frac{1}{2}(12)(16)(10)$

$V = 960 \, cm^3$

20 cm
16 cm
10 cm
12 cm
h
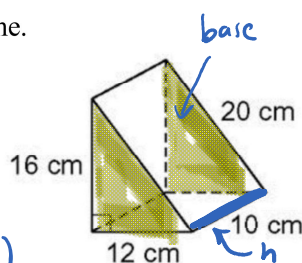
2) Find the volume of the square pyramid shown, if the perimeter of the base is 24 in.

$V = \frac{1}{3}Bh$
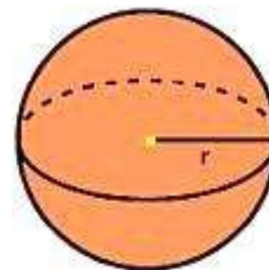
$= \frac{1}{3}(6^2)(8)$

$V = 96 \, in^3$

8 in
6 in

3) A basketball is shown below. Find the Volume, in terms of x and pi, if the radius of the basketball is represented by $6x$.
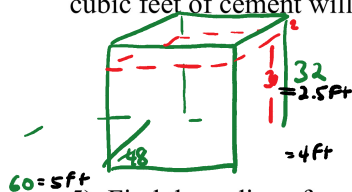
$V = \frac{4}{3}\pi r^3$

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

$= \frac{4}{3}\pi(216x^3)$

$V = 288\pi x^3$

r

4) A container for mixing cement is shaped like a rectangular prism with a length of 60 inches, a width of 48 inches, and a height of 32 inches. The container can be safely filled within 2 inches of the top. Nicole makes enough cement to fill the container one time in order to fulfill an order for 48 *cubic feet* of cement. How many cubic feet of cement will she have left after filling the order?

$50 - 48 =$ $2 \, ft^3$ left

$V = Bh$

$= 5(4)(2.5)$

$V = 50 \, ft^3$

32
= 2.5 ft
48
= 4 ft
60 = 5 ft

5) Find the radius of a sphere whose volume is 420 m³. Round to the nearest tenth.

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

$\left(\frac{3}{4\pi}\right)420 = \frac{4}{3}\pi r^3\left(\frac{3}{4\pi}\right)$

$\sqrt[3]{r^3} = \sqrt[3]{100.268}$

$r = 4.6 \, m$

6) A sphere has a volume of 972π ft³. Find the radius.

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

$\left(\frac{3}{4\pi}\right)972\pi = \frac{4}{3}\pi r^3\left(\frac{3}{4\pi}\right)$

$\sqrt[3]{r^3} = \sqrt[3]{729}$

$r = 9 \, ft$

7) A paperweight is made of pure iron and is in the shape of a cone. The cone has diameter of 4 cm and is 6 cm tall. If the iron costs $3.50 per gram, how much is the paperweight worth? Hint: iron weighs approximately 7.8 grams per cubic centimeter.

$$V = \frac{1}{3}\pi r^2 h$$
$$= \frac{1}{3}\pi (2)^2 (6)$$
$$V = 8\pi \text{ cm}^3$$

$$\begin{array}{r} 8\pi \\ \times \quad 7.8 \\ \hline 196.04 \text{ g} \end{array}$$

$$\begin{array}{r} 196.04 \\ \times \quad 3.50 \\ \hline \boxed{\$686.12} \end{array}$$

8) If two similar solids have ratio of volumes of 16 : 54, and the surface area of the larger solid is 108π in², find the surface area of the smaller solid.

r of V = 16:54
             8:27

s.f. = 2:3

r of SA = 4:9
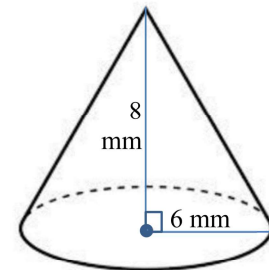
$$\frac{4}{9} = \frac{x}{108\pi}$$
$$9x = 432\pi$$
$$\boxed{x = 48\pi \text{ in}^2}$$

9) Find the Volume of the cone shown, in terms of pi.

$$V = \frac{1}{3}\pi r^2 h$$
$$= \frac{1}{3}\pi (6)^2 (8)$$
$$\boxed{V = 96\pi \text{ mm}^3}$$

8 mm
6 mm

10. What is the ratio of the volumes of two cubes with edges of lengths 4 inches and 8 inches?

A. 1:8
B. 16:64
C. 125:512
D. 625:4096

s.f = 4:8
     = 1:2

R of V = $1^3 : 2^3$
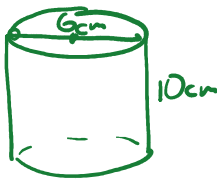   = 1 : 8

11. Two similar cones have radii of 3 cm and 8 cm. Find the ratio of their volumes, small to large.

$$s.f. = 3:8$$

$$R \, of \, V = 3^3 : 8^3$$

$$= \boxed{27 : 512}$$

12. A paperweight is made of pure silver in the shape of a cylinder. The cylinder has diameter of 6 cm and is 10 cm tall. If the silver weighs 10.5 grams per cubic centimeter, to the nearest hundredth of a gram, how much does the paperweight weigh?

$$V = \pi r^2 h$$

$$V = \pi (3)^2 (10)$$

$$V = 90\pi \, cm^3$$

$$90\pi (10.5) \quad \boxed{\approx 2,968.81 \, g}$$

13-14:. A manufacturer is designing two geometrically similar cylinders to be made out of plastic. She needs a volume calculation know how much plastic to order.

13. The height of the green cylinder is 7 centimeters. The height of the blue cylinder is 10 centimeters. What is the ratio of volumes (small to large?)

$$s.f = 7:10$$

$$R \, of \, V = 7^3 : 10^3$$

$$= 343 : 1000$$

14. If the blue cylinder has a volume of 36 cubic centimeters, what is the volume of the green cylinder? Retain every digit of the decimal.

$$\frac{343}{1000} \times \frac{x}{36}$$

$$\frac{1000x}{1000} = \frac{12348}{1000}$$

$$\boxed{x = 12.348 \, cm^3}$$

15. The volume of a sphere is $\frac{500}{3}\pi$ inches cubed. What is its radius?

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

$$\left(\frac{3}{4\pi}\right)\frac{500}{3}\pi = \frac{4}{3}\pi r^3 \left(\frac{3}{4\pi}\right)$$

$$\sqrt[3]{r^3} = \sqrt[3]{125}$$

$$\boxed{r = 5 \, in}$$

Answers:

1) 960 cm³	2) 96 in³	3) 288πx³ units³	4) $2 \, ft^3$	5) $4.6 \, cm$	6) 9 feet
7) $686.12	8) 48π in²	9) $V = 96\pi \, mm^3$	10) A	11) $27:512$	12) 2968.81 grams
13) 343:1000	14) 12.348 cubic centimeters	15) 5 inches			

3 | P a g e