Volume of Composite Figures-Notes

Geometry 3313

Name __key__

Date _____ Period _____

1) Mariana bought a new pencil like the one shown below on the left. She used the pencil every day in her math class for a week, and now her pencil looks like the one shown below on the right. How much of the pencil, in terms of volume, did she use?

Note: Figures are not drawn to scale

$r = \left(\dfrac{3}{4}\right)\left(\dfrac{1}{2}\right) = \dfrac{3}{8}$
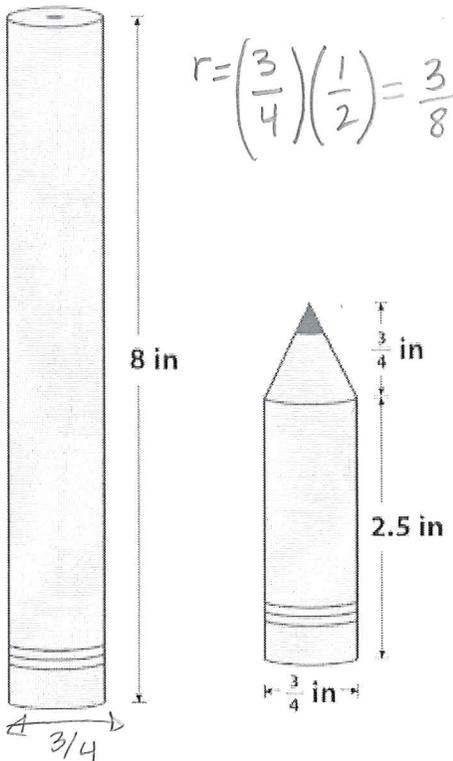
Volume of new pencil $= \pi r^2 h = \pi\left(\dfrac{3}{8}\right)^2(8)$

$= \pi\left(\dfrac{9}{64}\right)(8) = \dfrac{9\pi}{8}$ in^2

$\approx \boxed{3.53\,\text{in}^3}$

Volume of used pencil $=$ pencil tip + rest of the pencil

$=$ cone + cylinder

$= \dfrac{\pi\left(\dfrac{3}{8}\right)^2\left(\dfrac{3}{4}\right)}{3} + \pi\left(\dfrac{3}{8}\right)^2(2.5)$

$= \dfrac{\pi\left(\dfrac{9}{64}\right)\left(\dfrac{3}{4}\right)}{3} + \pi\left(\dfrac{9}{64}\right)(2.5)$

$= .11 + 1.1 = \boxed{1.21\,\text{in}^3}$

Mariana used
$3.53\,\text{in}^3 - 1.21\,\text{in}^3 = \boxed{2.32\,\text{in}^3}$

Find the volume of each of the following composite figures.

2.

$h^2 + 5^2 = 13^2$

$h^2 = 144$

$\boxed{h = 12}$
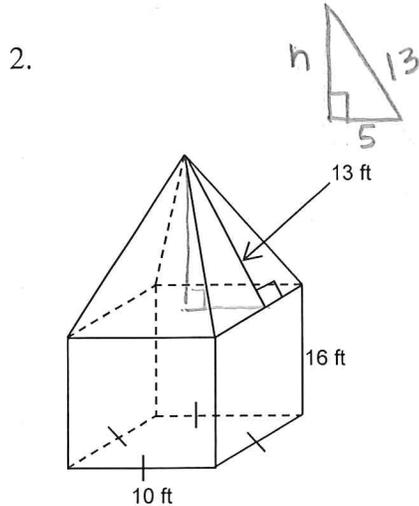
Volume of pyramid:

$V = \dfrac{(10)(10)(12)}{3} = \boxed{400\,\text{ft}^3}$

Volume of prism:

$V = (10)(10)(16) = \boxed{1600\,\text{ft}^3}$

Total Volume:

$\boxed{2000\,\text{ft}^3}$

3.

$3 \quad 5$
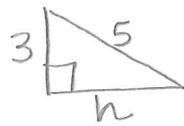
$h^2 + 3^2 = 5^2$

$n^2 = 16$

$\boxed{h = 4}$

Volume of cone:

$$V = \frac{\pi (3)^2 (5)}{3} = \boxed{47.12 u^3}$$

50

r=3   3   5

6
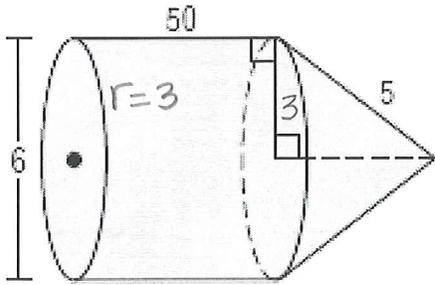
Volume of cylinder:

$$V = \pi (3)^2 (50) = \boxed{1413.72 u^3}$$

Total Volume: $\boxed{1460.84 u^3}$

4.

71 cm.

7 cm

7cm.

40 cm.
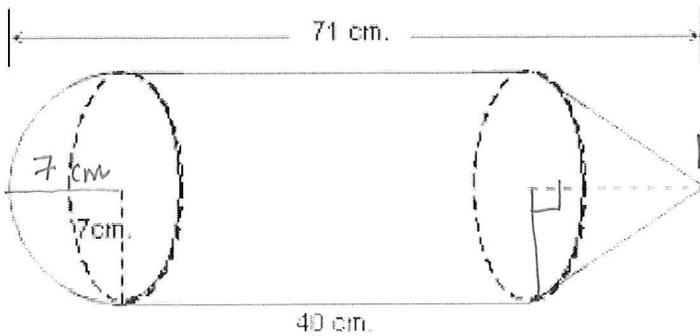
$h = 71 - 7 - 40 = 24$

Volume of hemisphere: $\frac{1}{2} V = \frac{1}{2}\left[\frac{4\pi (7)^3}{3}\right] = \boxed{102.62 \, cm^3}$

Volume of cylinder: $V = \pi (7)^2 (40) = \boxed{6157.52 cm^3}$

Volume of cone: $V = \frac{\pi (7)^2 (24)}{3} = \boxed{1231.50 cm^3}$

Total Volume: $\boxed{7491.64 cm^3}$

Volume of Composite Figures-Homework

Geometry 3313

Name _key_

Date_____ Period _____

Find the volume of each of the following composite figures. Write the formulas you are using and show all your work.

1.

18 cm   r=9   12 cm
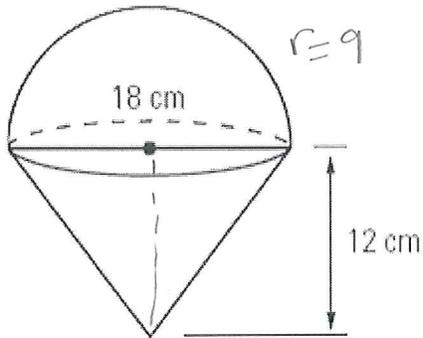
Volume of hemisphere $= \frac{1}{2}V$

$$= \frac{1}{2}\left[\frac{4\pi(9)^3}{3}\right]$$

$$= \boxed{169.65\,cm^3}$$

Volume of cone $= \dfrac{\pi(9)^2(12)}{3}$

$$= \boxed{1017.88\,cm^3}$$

Volume _1187.53 cm³_

2.

30 ft   32 ft   32 ft   32 ft
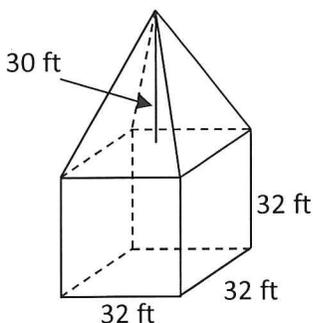
Volume of pyramid $= \dfrac{Bh}{3} = \dfrac{(32)(32)(30)}{3}$

$$= \boxed{10{,}240\,ft^3}$$

Volume of prism $= Bh = (32)(32)(32)$

$$= \boxed{32768\,ft^3}$$

Volume _43 0008 ft³_

3.

3 m
6 m
8 m
10 m
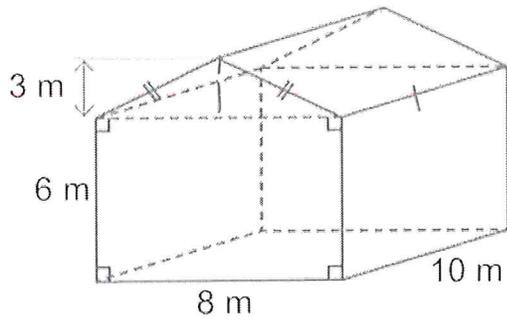
$\text{Volume of pyramid} = \dfrac{Bh}{3} = \dfrac{(8)(10)(3)}{3}$

$= \boxed{80 m^3}$

$\text{Volume of prysm} = Bh = (6)(8)(10)$

$= \boxed{480 m^3}$

Volume __560 m³__

4.

10 mm
9 mm
7 mm
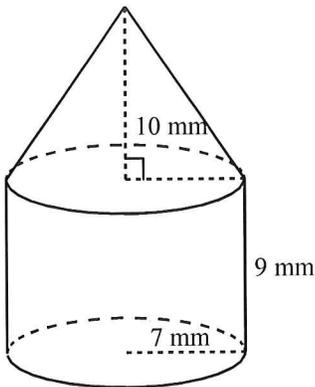
$\text{Volume of cone} = \dfrac{Bh}{3} = \dfrac{(\pi)(7^2)(10)}{3}$

$= \boxed{513.13 mm^3}$

$\text{Volume of cylinder} = Bh = \pi(7)^2(9)$

$= \boxed{1385.44 mm^3}$

Volume __1898.57 mm³__