Date _____

Geometry CC

Volume of Composite Shapes

Questions 1 through 4 refer to the following:

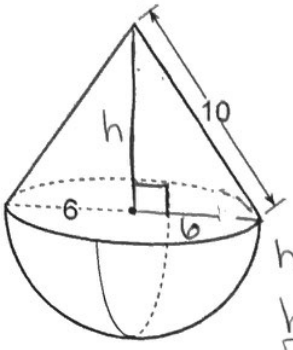
Find, to the *nearest* hundredth, the volume of the given composite solid.

1)

*hemisphere & cone

$V_{hemi} = \frac{2}{3}\pi(6)^3 = 144\pi$

$V_{cone} = \frac{1}{3}\pi(6)^2(8) = 96\pi$



$h^2+6^2=10^2$

$h^2+36=100$

$\sqrt{h^2}=\sqrt{64}$

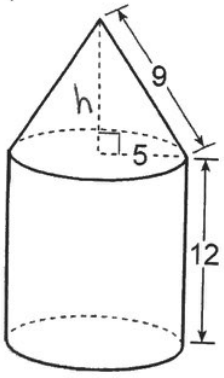
$h=8$

$Vol = 144\pi + 96\pi$

$= \boxed{753.98}$

2)

*cylinder + cone



$h^2+5^2=9^2$

$h^2+25=81$

$h^2=56$

$h=\sqrt{56}$

$V_{cyl} = \pi(5)^2(12) = 300\pi$

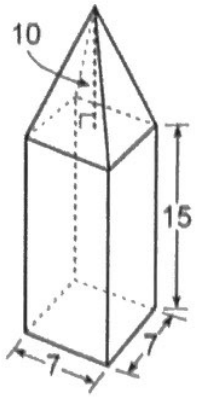
$V_{cone} = \frac{1}{3}\pi(5)^2(\sqrt{56}) = 195.9127$

$Vol = 300\pi + 195.9127$

$= \boxed{1138.39}$

3)

*pyramid & rectangular prism

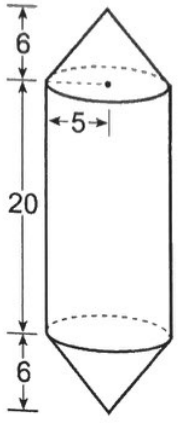


$V_{rec} = Bh = (7)(7)(15) = 735$

$V_{pyr} = \frac{1}{3}Bh = \frac{1}{3}(7)(7)(10) = 163.3333$

$Vol = 735 + 163.3333 = \boxed{898.33}$

4)



*2 cones & cylinder

$V_{cone} = \frac{1}{3}\pi(5)^2(6) = 50\pi$

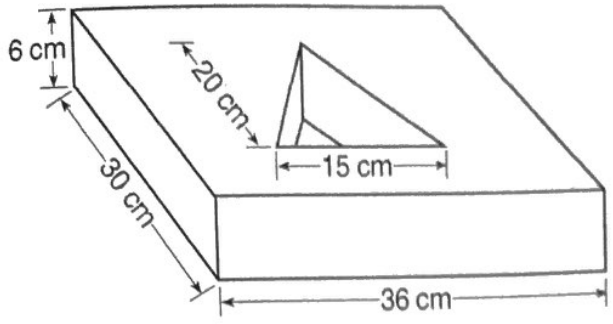
$2\ cones = 2(50\pi) = 100\pi$

$V_{cylinder} = \pi(5)^2(20) = 500\pi$

$Vol = 100\pi + 500\pi$

$= \boxed{1884.96}$

5) The figure below shows dimensions of a block of foam used to package a triangular shaped product. The foam is in the shape of a rectangular prism with a small triangular prism removed from the center.



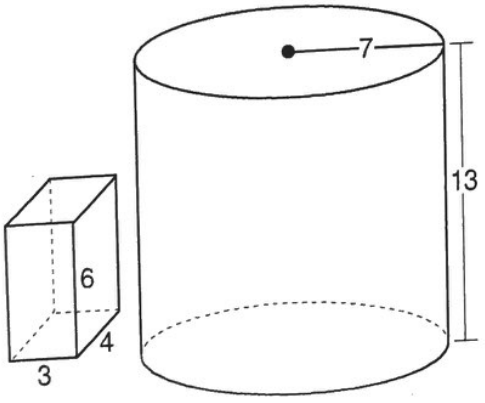
How many cubic centimeters of foam are used to package this product?

$V_{rec} = Bh = (36)(30)(6) = 6480$

$V_{tri} = Bh = (\frac{1}{2}(15)(20))(6) = 900$

$Foam = 6480 - 900 = \boxed{5580}$

6) Elana is making spaghetti sauce. She is cooking it in a cylindrical pot that is 13 inches tall and has a radius of 7 inches. The sauce is 1 inch from the top of the pot. She plans on transferring the sauce to rectangular containers that are 6 inches tall, with bases that are 3 inches by 4 inches.



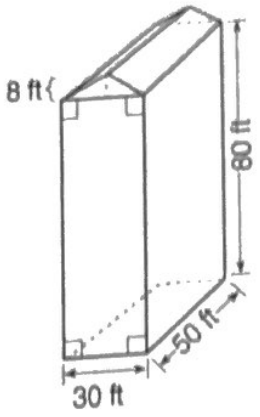
If she fills each rectangular container 1 inch from the top, approximately how many containers will she need to hold all of the sauce in the pot?

$V_{sauce} = \pi(7)^2(12) = 588\pi$

$V_{container} = (3)(4)(5) = 60$

$\frac{588\pi}{60} \approx \boxed{31 \text{ containers}}$

7) The cooling system for the building shown below can reduce the temperature 15° F at a rate of 925 cubic feet per minute.



How many minutes will it take to lower the temperature of the building from 75° F to 60° F? [*Round the answer to the nearest minute.*]

* rectangular prism + triangular prism

$V_{rec} = (30)(50)(80) = 120{,}000$

$V_{tri} = Bh = (\frac{1}{2}(30)(8))(50) = 6000$

$V_{building} = 120{,}000 + 6{,}000$
$= 126{,}000 \text{ ft}^3$

$\frac{126{,}000}{925} \approx \boxed{136 \text{ min}}$