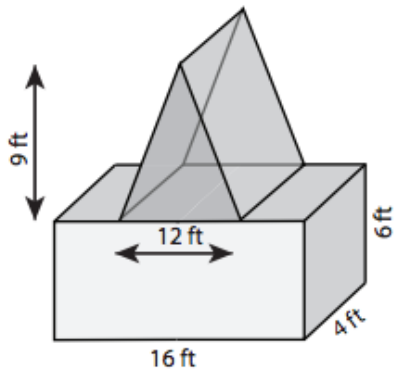
PCFU – Mixed Volume D7 Name _____ #___

Find the volume of each solid. Show all work.

1.



The first thing I had to do was to identify what shapes were combined to form this shape. I saw a triangular prism on top of a rectangular prism. I decided that I needed to find the volume of each then combine them by adding.

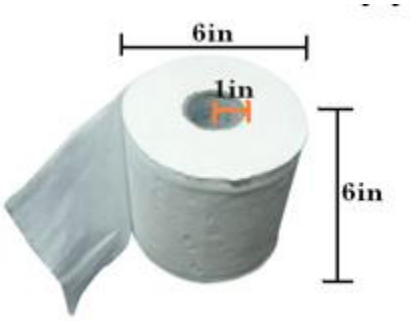
Volume of Triangular Prism: Area of triangular base · height of prism = $\frac{1}{2}(b\ of\ triangle) \cdot (h\ of\ triangle) \cdot (height\ of\ prism) = \frac{1}{2}(12)(9)(4) = 216\ ft^3$

Volume of Rectangular Prism: Area of rectangular base · height of prism = $(length\ of\ base) \cdot (width\ of\ base) \cdot (height\ of\ prism) = (16)(4)(6) = 384\ ft^3$

Combined volume = Vol. of Triangular Prism + Vol. of Rectangular Prism =

$$216 + 384 = \boxed{600\ ft^3}$$

2.



The inside radius is 1 inch.

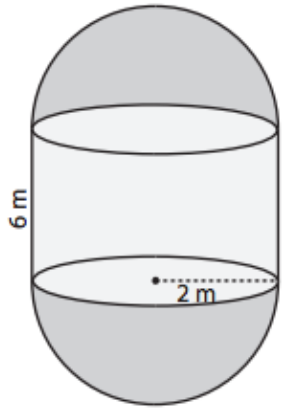
The first thing I had to do was to identify what shapes were combined to form this shape. I realized the cardboard roll inside the toilet tissue was a cylinder. Also the actual toilet tissue formed another cylinder around the cardboard roll. In this case I determined that I needed to subtract the volumes of the two cylinders to find the volume of the toilet tissue alone.

Volume of the Big Cylinder (toilet tissue and cardboard roll together):
Area of circular base · height of prism = $\pi r^2 h = \pi\,(3)^2(6) = \pi(9)(6) = 54\pi\ in^3$
[The diameter of the TP was 6 inches so I took half of that for the radius.]

Volume of the Small Cylinder (cardboard roll):
Area of circular base · height of prism = $\pi r^2 h = \pi\,(1)^2(6) = \pi(1)(6) = 6\pi\ in^3$

Volume of the toilet tissue alone:
Volume of Big Cylinder – Volume of Small Cylinder = $54\pi - 6\pi = \boxed{48\pi \approx 150.79\ in^3}$

3.



This shape looked like a giant pill to me. I saw the middle as a cylinder and the top and bottom as identical half-spheres. Since the two half-spheres are identical, I thought of them as combining to make a whole sphere. To find the total volume of everything I decided to combine the volume of the cylinder and the volume of the whole sphere by adding.

Volume of the Middle Cylinder: Area of circular base · height of cylinder = $\pi r^2 h = \pi\,(2)^2(6) = \pi(4)(6) = 24\pi\ m^3$

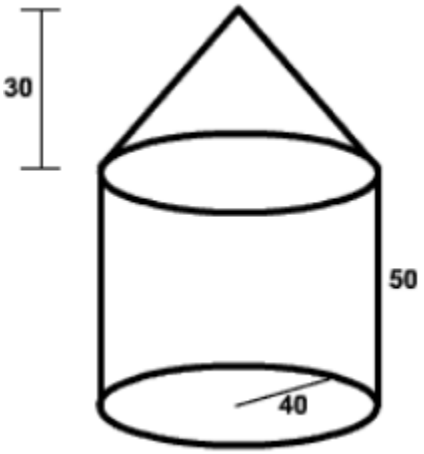
Volume of Sphere formed by combining top and bottom:
$\frac{4}{3}\pi r^3 = \frac{4}{3}\pi(2)^3 = \frac{4}{3}\pi(8) = \frac{32}{3}\pi\ m^3$

Combined Volume of Everything =
Volume of Middle Cylinder + Volume of Sphere formed by top and bottom combined

$$= 24\pi + \frac{32}{3}\pi = \boxed{\frac{104}{3}\pi \approx 108.91\ m^3}$$

Additional Practice on back →

1. Find the volume.



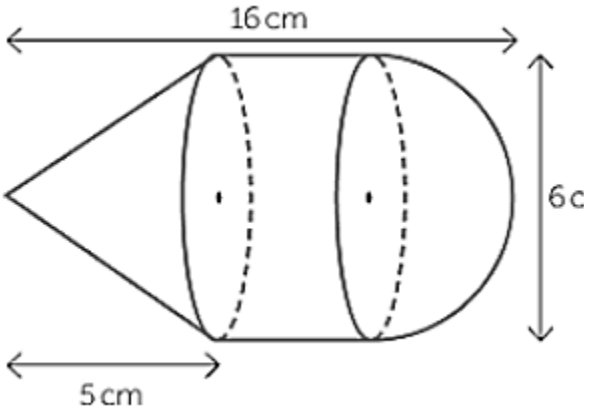
a) Identify the TWO shapes that are combined .

b) Write the equation for the volume of each part of the shape.

c) Substitute into your equations to find the volume for each part.

d) Determine if you need to add or subtract the volumes then perform the required operation to give your final answer.

2. Find the volume.



*Not drawn to scale.

THREE shapes are combined to form this. They are:
Cone
Cylinder
Half Sphere
.

a) Write the equation for the volume of each part of the shape.

b) Find the missing measurements.
Radius:
Height of Cone:
Height of Cylinder:
Height of Half-Sphere:

c) Substitute into your equations to find the volume for each part.

d) Determine if you need to add or subtract the volumes then perform the required operation to give your final answer.