Geometry
Volume of Prisms & Cylinders

Name: _____
Date: _____

Classwork/Homework: Volume of Composite Solids

Find the volume of each of the following composite functions.

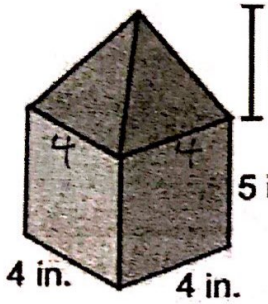
1.

$V_{sphere} = \frac{4}{3}\pi 6^3 = 904.8$ $V_{hemisphere} = \frac{904.8}{2} = 452.4\ in^3$

$V_{cylinder} = \pi 6^2 \cdot 13 = 1470.3\ in^3$

$V_{Total} = 452.4 + 1470.3 = 1922.7\ in^3$

2.

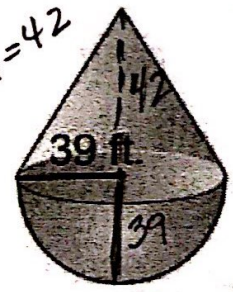


$V_{pyramid} = \frac{1}{3}(4.4) \cdot 6 = 32\ in^3$

$V_{prism} = 4 \cdot 4 \cdot 5 = 80\ in^3$

$V_{Total} = 32 + 80 = 112\ in^3$

3.

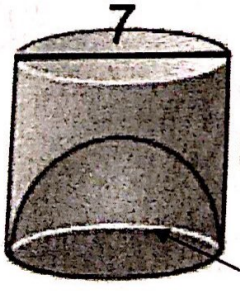


$V_{cone} = \frac{1}{3} \cdot \pi 39^2 \cdot 42 = 66,897.1\ ft^3$

$V_{sphere} = \frac{4}{3}\pi 39^3 = 248,474.8$ $V_{hemi} = \frac{248,474.8}{2} = 124,237.4\ ft^3$

$V_{Total} = 66,897.1 + 124,237.4 = 191,134.5\ ft^3$

4.



$V_{cyl} = (\pi 3.5^2)\,5.5 = 211.7\ units^3$

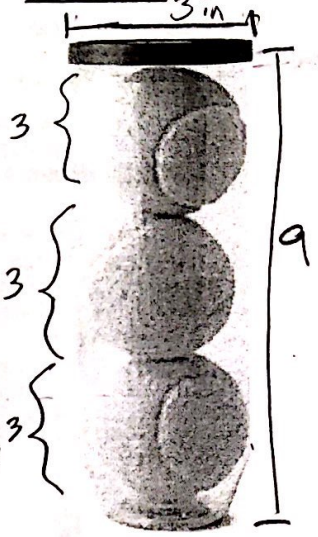
$V_{sphere} = \frac{4}{3}\pi 3.5^3 = 179.6$ $V_{hemi} = \frac{179.6}{2} = 89.8\ units^3$

$V_{Total} = 211.7 - 89.8 = 121.9\ units^3$

open hemisphere (subtract)

spheres

Tennis balls with a **3 inch diameter** (radius = 1.5) are sold in cans of three. The can is a **cylinder.**



5. What is the volume of one tennis ball?

$V_{\text{one tennis ball}} = \frac{4}{3}\pi 1.5^3 = \boxed{14.1 \text{ in}^3}$

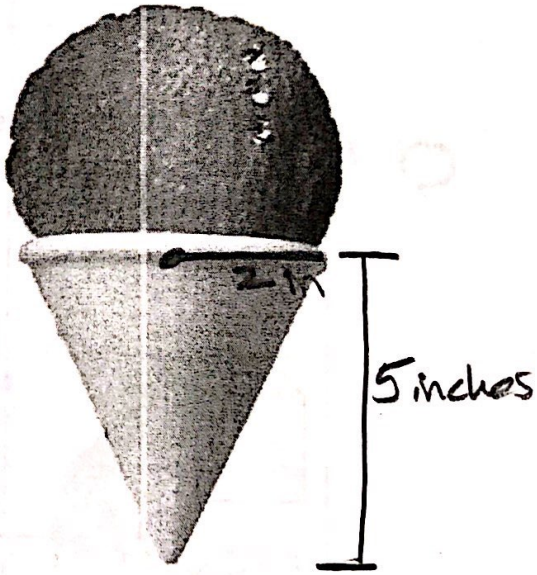
6. What is the volume of the cylinder?

$V_{\text{cylinder}} = \pi 1.5^2 \cdot 9 = \boxed{63.6 \text{ in}^3}$

7. How much space is not occupied by the tennis balls in the can?

$V_{\text{empty space}} = 63.6 - 3(14.1) = \boxed{21.3 \text{ in}^3}$

One hot day at a fair you buy yourself a snow cone. The height of the cone shaped container is 5 in and its radius is 2 in. The shaved ice is perfectly rounded on top forming a hemisphere.



8. What is the volume of the ice in your frozen treat?

$V_{\text{sphere}} = \frac{4}{3}\pi 2^3 = 33.5$ $V_{\text{hemi}} = \frac{33.5}{2} = \boxed{16.8 \text{ in}^3}$

$V_{\text{cone}} = \frac{1}{3}\pi 2^2 \cdot 5 = \boxed{20.9 \text{ in}^3}$

$V_{\text{Total}} = 16.8 + 20.9 = \boxed{37.7 \text{ in}^3}$

The volume of one ball is 288π in.³

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

9. What is the radius of the ball?

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

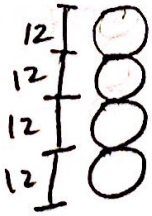
$864 = 4r^3$

$\frac{864}{4} = r^3$

$216 = r^3$

$\boxed{r = 6}$

10. If 4 of the balls were stacked on top of each other, how tall would the stack be?



Diameter = 12 $12(4) = 48$

$\boxed{48 \text{ inches}}$