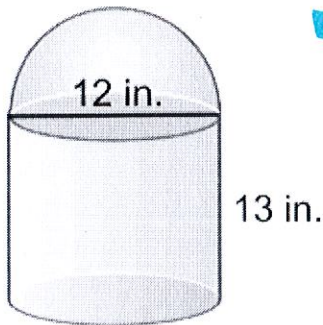Name: _____ Date: _____

Volume of Composite Solids

Find the volume of each of the following composite functions.
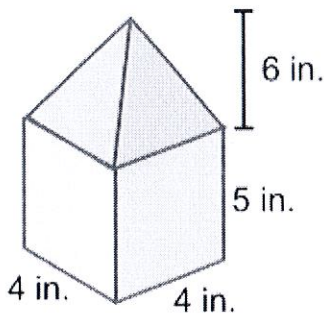
1.

12 in.

13 in.

$$V_{top} = \frac{\frac{4}{3}\pi(6)^3}{2} = 144\pi$$

$$V_{bottom} = (\pi 6^2)(13) = 468\pi$$

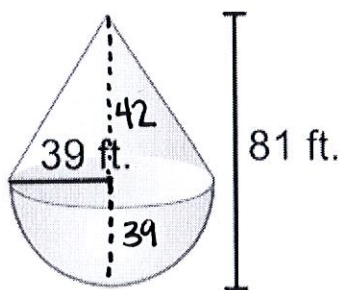$$V_{total} = 144\pi + 468\pi = \boxed{612\pi = 1922.7}$$

2.

6 in.

5 in.

4 in.   4 in.

$$V_{top} = \frac{1}{3}(4 \cdot 4)(6) = 32$$

$$V_{bottom} = (4 \cdot 4)(5) = 80$$

$$V_{total} = 32 + 80 = \boxed{112}$$

3.

42

39 ft.

39

81 ft.
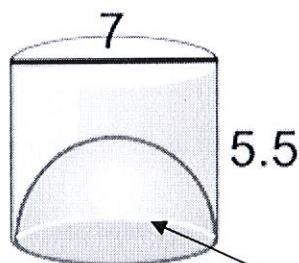
$$V_{top} = \frac{1}{3}(\pi(39^2))(42) = 21,294\pi$$

$$V_{bottom} = \frac{\frac{4}{3}\pi(39)^3}{2} = 39,546\pi$$

$$V_{total} = 21,294\pi + 39,546\pi = \boxed{\begin{array}{c}60,840\pi \\ 191,134.5\end{array}}$$

4.

7

5.5

$$V_{top} = (\pi 3.5^2)(5.5) = \frac{539\pi}{8}$$

$$V_{bottom} = \frac{\frac{4}{3}\pi 3.5^3}{2} = \frac{343\pi}{12}$$

$$V_{total} = \frac{539\pi}{8} - \frac{343\pi}{12} = \boxed{\frac{931\pi}{24} = 121.9}$$

Open hemisphere

5. **Tennis balls with a 3 inch diameter are sold in cans of three. The can is a cylinder.**

a) What is the volume of one tennis ball?

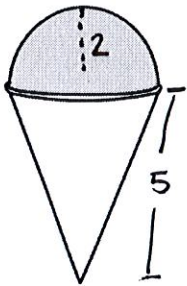$r = 1.5$ $\frac{4}{3}\pi(1.5)^3 = \boxed{\frac{9\pi}{2} = 14.14}$

b) What is the volume of the cylinder?

$r = 1.5$
$h = 9$ $(\pi(1.5)^2)(9) = \boxed{\frac{81\pi}{4} = 63.6}$

c) How much space is not occupied by the tennis balls in the can?

$V_{cylinder} - V_{3\ tennis\ balls}$

$\frac{81\pi}{4} - 3\left(\frac{9\pi}{2}\right) = \boxed{\frac{27\pi}{4} = 21.2}$

6. **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.**

$V_{top} = \dfrac{\frac{4}{3}\pi(2)^3}{2} = \dfrac{16\pi}{3}$

$V_{bottom} = \frac{1}{3}(\pi 2^2)(5) = \frac{20\pi}{3}$

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

$V_{total} = \frac{16\pi}{3} + \frac{20\pi}{3} = \boxed{12\pi = 37.7}$