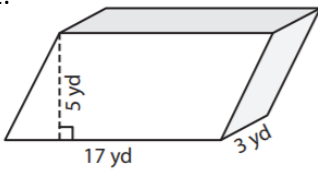


Calculate the volumes of all the figures below. Use the knowledge that you have!!!

1.

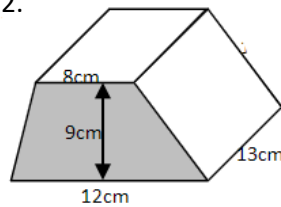


$$V = (bh)l$$

$$V = (17)(5)(3)$$

$$V = 255 \text{ yd}^3$$

2.



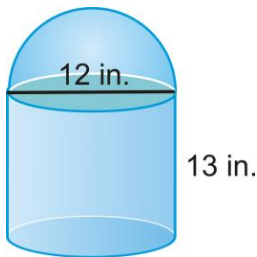
$$V = \frac{(a+b)h}{2} \times l$$

$$V = \frac{(8+12)9}{2} \times 13$$

$$V = 90 \times 13$$

$$V = 1170 \text{ cm}^3$$

3.



Semi-sphere $\Rightarrow V = \frac{2\pi r^3}{3}$

$$V = \frac{2(3.14)(12)^3}{3}$$

$$V = 452.16$$

Cylinder $\Rightarrow V = \pi r^2 h$

$$V = (3.14)(12)^2(13)$$

$$V = 1469.52$$

Total Volume is 1921.68 in^3

4.



$$\begin{aligned} r^2 + h^2 &= s^2 \\ 5^2 + h^2 &= 13^2 \\ 25 + h^2 &= 169 \\ h^2 &= 144 \\ h &= 12 \end{aligned}$$

★ If you used 13 as height, that is fine.

Cone: $V = \frac{\pi r^2 h}{3}$

$$V = \frac{(3.14)(5)^2(12)}{3}$$

$$V = 314$$

Cylinder:

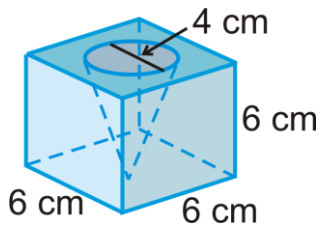
$$V = \pi r^2 h$$

$$V = (3.14)(5)^2(2)$$

$$V = 157$$

Total $V = 471 \text{ cm}^3$

5.

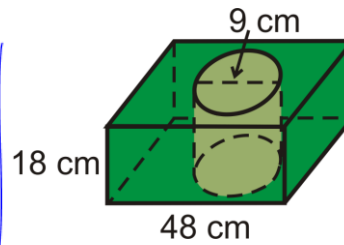


$$\begin{aligned}\text{Cube: } V &= b^3 \\ V &= 6^3 \\ V &= 216 \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Cone: } V &= \frac{\pi r^2 h}{3} \\ V &= \frac{(3.14)(2^2)(6)}{3} \\ V &= 25.12 \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Total Volume} &= 216 \\ &- 25.12 \\ &= 190.88 \text{ cm}^3\end{aligned}$$

6. Square based box with a cylindrical hole.

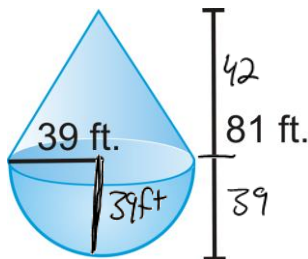


$$\begin{aligned}\text{Box: } V &= lwh \\ V &= (48)(48)(18) \\ V &= 41472 \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Cylinder: } V &= \pi r^2 h \\ V &= (3.14)(4.5^2)(18) \\ V &= 1144.53\end{aligned}$$

$$\begin{aligned}\text{Total Volume} &= 41472 - 1144.53 \\ &= 40327.47 \text{ cm}^3\end{aligned}$$

7.

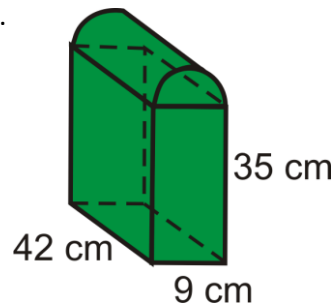


$$\begin{aligned}\text{Cone: } V &= \frac{\pi r^2 h}{3} \\ V &= \frac{(3.14)(39^2)(42)}{3} \\ V &= 66863.16\end{aligned}$$

$$\begin{aligned}\text{Semi-Sphere: } V &= \frac{2\pi r^3}{3} \\ V &= \frac{2(3.14)(39^3)}{3} \\ V &= 124,174.44\end{aligned}$$

$$\text{Total Volume} = 191,037.6 \text{ ft}^3$$

8.



$$\begin{aligned}\text{Box: } V &= lwh \\ V &= (42)(9)(35) \\ V &= 13,230 \text{ cm}^3\end{aligned}$$

$$\begin{aligned}\text{Semi-Cylinder: } V &= \frac{\pi r^2 h}{2} \\ V &= \frac{(3.14)(4.5^2)(42)}{2} \\ V &= 1335.29 \text{ cm}^3\end{aligned}$$

$$\text{Total Volume} = 14565.29 \text{ cm}^3$$

9. Tennis balls with a 3 inch diameter are sold in cans of three. The can is a cylinder. Assume the balls touch the can on the sides, top and bottom.

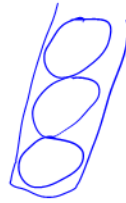
a) What is the volume of one tennis ball?

$$V = \frac{4\pi r^3}{3} \quad r = 1.5$$

$$V = \frac{4(3.14)(1.5)^3}{3}$$

$$V = 14.13 \text{ in}^3$$

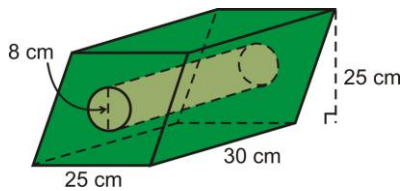
b) What is the volume of the space not occupied by the tennis balls?



Cylinder: $V = \pi r^2 h$
 $V = (3.14)(1.5)^2(9)$ ↗ diameter of 3 balls
 $V = 63.59 \text{ in}^3$

Empty space: $V = 63.59 - 3(14.13)$
 $V = 21.2 \text{ in}^3$

10. Cut out the cylinder.

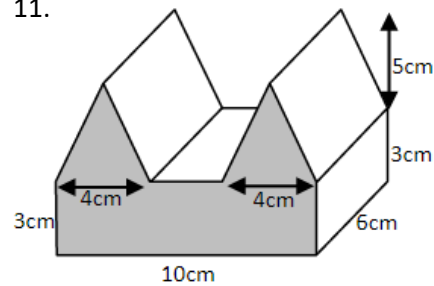


Parallelogram: $V = bhl$
 $V = (25)(25)(30)$
 $V = 18750 \text{ cm}^3$

Cylinder: $V = \pi r^2 h$
 $V = (3.14)(4)^2(30)$
 $V = 1507.2 \text{ cm}^3$

Total $V = 17242.8 \text{ cm}^3$

11.



Bottom Box: $V = lwh$
 $V = (10)(6)(3)$
 $V = 180 \text{ cm}^3$

Two Triangular Tops: $V = 2 \left(\frac{bhl}{2} \right)$
 $V = (4)(5)(6)$
 $V = 120 \text{ cm}^3$

Total $V = 300 \text{ cm}^3$

Find the surface area of each figure. Careful with the formulas as not all parts need to be covered....

12.



13 in.

SA of Semi-Sphere:

$$SA = \frac{4\pi r^2}{2}$$

$$SA = 2(3.14)(6)^2$$

$$SA = 226.08 \text{ in}^2$$

SA of Cylinder

$$SA = \pi r^2 + 2\pi r h$$

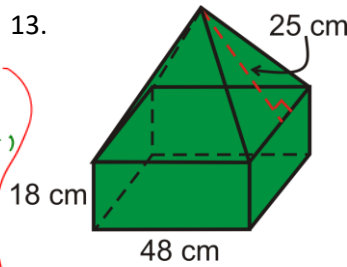
$$= (3.14)(6)^2 + 2(3.14)(6)(13)$$

$$= 113.04 + 489.84$$

$$= 602.88 \text{ in}^2$$

$$\text{Total SA} = 828.96 \text{ in}^2$$

13.



Pyramid - bottom:

$$SA = 2bs$$

$$= 2(48)(25)$$

$$= 2400 \text{ cm}^2$$

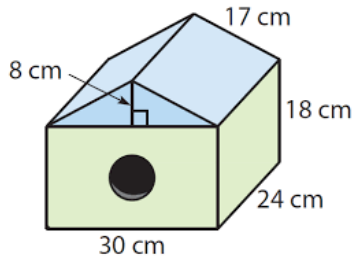
Box - Top: $SA = (48)(48) + 4(18)(48)$

$$= 2304 + 3456$$

$$= 5760 \text{ cm}^2$$

$$\text{Total SA} = 8160 \text{ cm}^2$$

14. Hole is only on one side, with diameter of 8 cm.



Box - top: $SA = (30)(24) + 2(24)(18) + 2(30)(18)$

$$= 2664 \text{ cm}^2$$

Triangular Prism - Bottom: $SA = bh + A + B$

$$= (30)(8) + (17)(24) + (17)(24)$$

$$= 1056 \text{ cm}^2$$

Hole: $SA = \pi r^2$

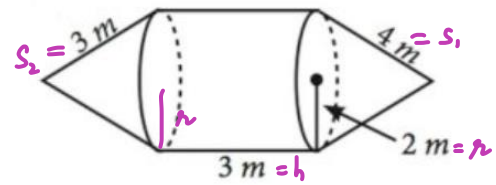
$$= (3.14)(4)^2$$

$$= 50.24 \text{ cm}^2$$

$$\text{Total SA} = 2664 + 1056 - 50.24$$

$$= 3669.76 \text{ cm}^2$$

15.



Cylinder - circles: $SA = 2\pi r h$

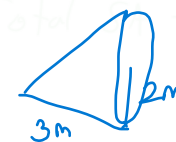
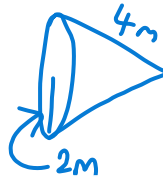
$$= 2(3.14)(2)(3)$$

$$= 37.68 \text{ m}^2$$

Cones - circles: $SA = \pi r s_1$

$$= (3.14)(2)(4)$$

$$= 25.12 \text{ m}^2$$



$$SA_2 = \pi r s_2$$

$$= (3.14)(2)(3)$$

$$= 18.84 \text{ m}^2$$

$$\therefore \text{Total SA} = 37.68$$

$$+ 25.12$$

$$+ 18.84$$

$$= 81.64 \text{ cm}^2$$