

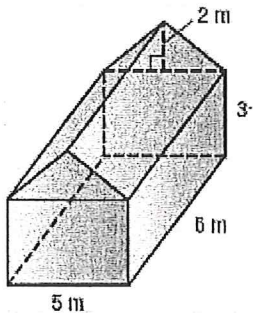
Chapter 11 - Composite Space Figures – 3-dimensional figures that are combinations of two or more simpler figures.

***VOLUME** – to find volume of the composite figure, just find the volume of EACH part separately, then **ADD** the volumes together!! (sometimes you will need to subtract volumes if there is a hole!)

****SURFACE AREA** – to find surface area of the composite figure, just find the surface area of EACH part separately, add them together, then consider whether you need to **SUBTRACT** out any faces that are NOT included in the surface!!!

Make your "list" for each section of the solid FIRST!

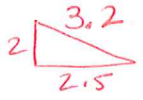
1.



Rect. Prism
 $B = 5(6) = 30$
 $H = 3$
 $P = 22$
 $V = BH = (30)(3) = 90$
 $SA = PH + 2B$
 $(22)(3) + 2(30)$
 $66 + 60$
 $126 m^2$
 $- 30$
 96

Triangular Prism

$B = \frac{1}{2}(2)(5) = 5$

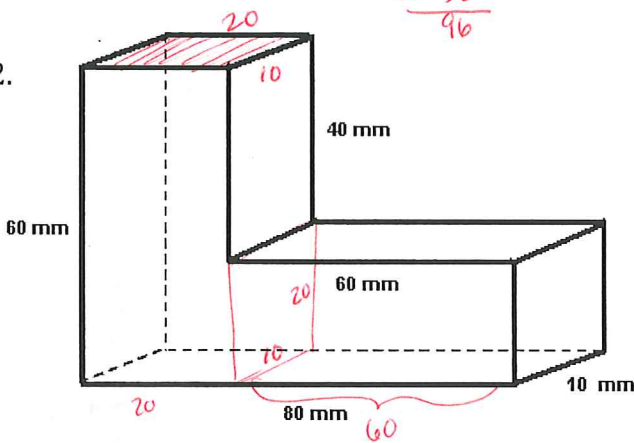


$H = 6$
 $P = 11.4$
 $V = BH = (5)(6) = 30$

$SA = PH + 2B$
 $(11.4)(6) + 2(5)$
 $68.4 + 10 = 78.4$
 $- 30$
 48.4

$V = 90 + 30 = 120 m^3$
 $SA = 96 + 26.21 = 122.21 m^2$

2.



Tall Rect. Prism
 $B = (10)(20) = 200$
 $H = 60$
 $P = 60$

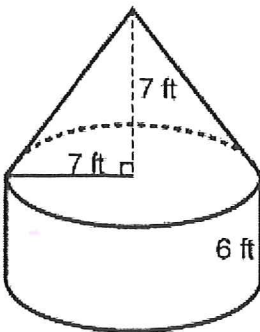
$V = (200)(60) = 12,000 mm^3$
 $SA = PH + 2B$
 $(60)(60) + 2(200)$
 $3600 + 400$
 4000
 $- 200$
 3800

Long Rect. Prism

$B = 10(60) = 600$
 $H = 20$
 $P = 140$
 $V = BH = (600)(20) = 12,000$
 $SA = PH + 2B$
 $(140)(20) + 2(600)$
 $2800 + 1200$
 4000
 $- 200$
 3800

$V = 24,000$
 $SA = 7,600$

3.



Cylinder

$C = 14\pi$
 $H = 6$
 $B = 49\pi$
 $V = BH = 49\pi(6) = 294\pi$
 $SA = PH + 2B$
 $14\pi(6) + 2(49\pi)$
 $84\pi + 98\pi$
 $182\pi - 49\pi = 133\pi$

Cone

$C = 14\pi$
 $H = 7$
 $B = 49\pi$
 $V = 294\pi + 114.3\pi = 408.3\pi \approx 1283.7 ft^3$
 $SA = 202.3\pi \approx 635.54 ft^2$
 $V = \frac{BH}{3} = \frac{(49\pi)(7)}{3} = \frac{343\pi}{3} = 114.3\pi$
 $SA = \frac{1}{2}Cl + B$
 $\frac{1}{2}(14\pi)(9.9) = 69.3\pi$

$l^2 = 7^2 + 7^2$
 $l = 9.9$

4. What are the approximate surface area and volume of this aquarium? Round to the nearest whole number.

Rectangular prism

$$V = (864)(24)$$

$$20,736$$

$$B = 864$$

$$H = 24$$

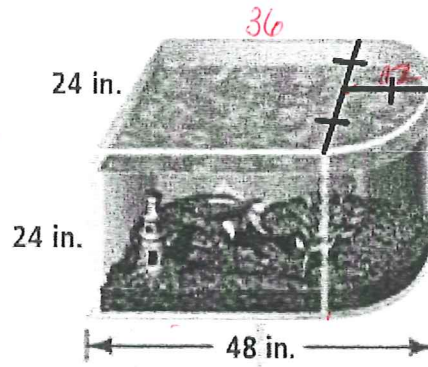
$$P = 180$$

Cylinder (1/2)

$$B = 144\pi/2 = 72\pi$$

$$C = 24\pi = 12\pi$$

$$H = 24$$



$$V = 72\pi(24)$$

$$1728\pi$$

$$\approx 5428.67$$

$$SA = PH + 2B$$

$$(120)(24) + 2(864)$$

$$2880 + 1728$$

$$4608$$

$$- 576$$

$$4032$$

(Subtract 24×24 square)

$$SA = \frac{CH + 2B}{2}$$

$$34\pi(24) + 2(144\pi)$$

$$576\pi + 288\pi$$

$$864\pi/2 \text{ (half cylinder)} = 432\pi \approx 1357.17$$

$$V = 26,164.67 \text{ in}^3$$

$$SA = 5389.17 \text{ in}^2$$

5. What are the approximate surface area and volume of this lunch box? Round to the nearest whole number.

Rect. prism

$$B = 60$$

$$H = 6$$

$$P = 32$$

$$V = 60(6) = 360$$

$$SA = PH + B \text{ (only 1 base showing)}$$

$$(32)(6) + 60$$

$$192 + 60$$

$$252$$

1/2 cylinder

$$C = 6\pi$$

$$H = 10$$

$$B = 9\pi$$

$$V = BH = 90\pi \text{ (full cylinder)}$$

$$1/2 \text{ cylinder} = \frac{90\pi}{2} = 45\pi \approx 141.37$$

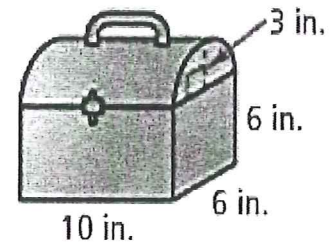
$$SA = \frac{CH + 2B}{2}$$

$$\frac{(6\pi)(10) + 2(9\pi)}{2}$$

$$\frac{60\pi + 18\pi}{2} = 39\pi \approx 122.52$$

$$V = 501.37 \text{ in}^3$$

$$SA = 374.52 \text{ in}^2$$



6. A lab technician made a 14 cm diameter hole through the middle of a cylinder that has a diameter of 20 cm and a height of 18 cm. What are the approximate surface area and volume of the finished cylinder? Round to the nearest whole number.

lg cylinder

$$C = 20\pi$$

$$H = 18$$

$$B = 100\pi$$

$$V = 1800\pi \approx 5654.87$$

Sm. cylinder hole

$$C = 14\pi$$

$$H = 18$$

$$B = 49\pi$$

$$V = (49\pi)(18)$$

$$882\pi = 2770.88$$

$$SA = CH + 2B$$

$$20\pi(18) + 2(100\pi)$$

$$360\pi + 200\pi$$

$$560\pi - 2(49\pi)$$

$$462\pi \approx 1451.42$$

$$2A = CH$$

$$(14\pi)(18)$$

$$252\pi$$

$$V = 2883.99 \text{ cm}^3$$

$$SA = 714\pi$$

$$\approx 2243.10 \text{ cm}^2$$

