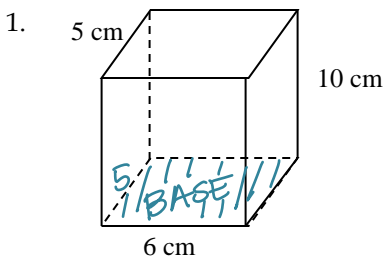


Find the indicated for each of the following figures.



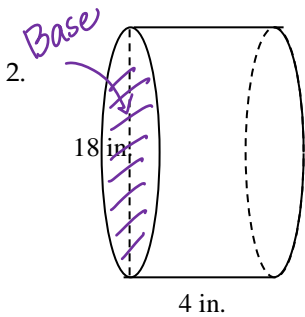
$$\begin{aligned} LSA &= p \cdot h \\ &= (5+5+6+6)10 \\ &= (22)10 \\ &= 220 \text{ cm}^2 \\ TSA &= LSA + 2 \cdot A_{\text{Base}} \\ &= 220 + 2(5 \cdot 6) \\ &= 220 + 60 \\ &= 280 \text{ cm}^2 \end{aligned}$$

Lateral Area = 220 cm<sup>2</sup>

Total Area = 280 cm<sup>2</sup>

Volume = 300 cm<sup>3</sup>

Parallel Cross Section: Rectangle



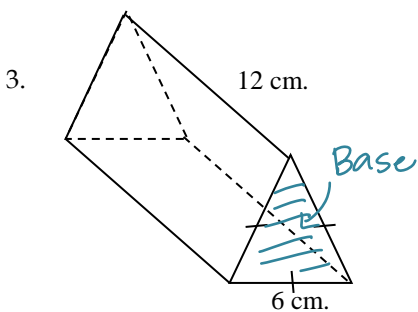
$$\begin{aligned} V &= A_{\text{Base}} \cdot h \\ &= 30 \cdot 10 \\ &= 300 \\ LSA &= p \cdot h \\ &= 18\pi \cdot 4 \\ &= 72\pi \\ TSA &= LSA + 2 \cdot A_{\text{Base}} \\ &= 72\pi + 2(81\pi) \\ &= 234\pi \\ V &= A_{\text{Base}} \cdot h \\ &= 81\pi \cdot 4 \\ &= 324\pi \end{aligned}$$

Lateral Area = 72π in<sup>2</sup>

Total Area = 234π in<sup>2</sup>

Volume = 324π in<sup>3</sup>

Parallel Cross Section: Circle



$$\begin{aligned} LSA &= p \cdot h \\ &= (6+6+6) \cdot 12 \\ &= 216 \\ TSA &= LSA + 2 \cdot A_{\text{Base}} \\ &= 216 + 2\left(\frac{6^2\sqrt{3}}{4}\right) \\ &= 216 + 18\sqrt{3} \\ V &= A_{\text{Base}} \cdot h \\ &= 9\sqrt{3} \cdot 12 \\ &= 108\sqrt{3} \end{aligned}$$

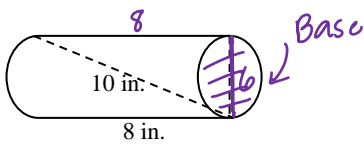
Lateral Area = 216 cm<sup>2</sup>

Total Area = (216 + 18√3) cm<sup>2</sup>

Volume = 108√3 cm<sup>3</sup>

Parallel Cross Section: triangle

4.



$$\begin{aligned}
 LSA &= p \cdot h \\
 &= 6\pi \cdot 8 \\
 &= 48\pi \\
 TSA &= LSA + 2 \cdot A_{\text{Base}} \\
 &= 48\pi + 2(9\pi) \\
 &= 66\pi \\
 V &= A_{\text{Base}} \cdot h \\
 &= 9\pi \cdot 8 \\
 &= 72\pi
 \end{aligned}$$

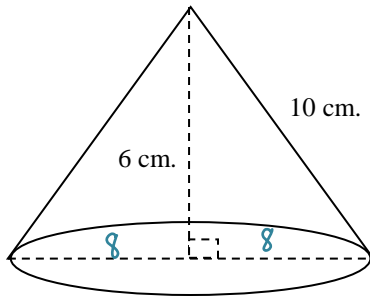
Lateral Area =  $48\pi \text{ in}^2$

Total Area =  $66\pi \text{ in}^2$

Volume =  $72\pi \text{ in}^3$

Parallel Cross Section: Circle

5.



$$\begin{aligned}
 LSA &= \frac{p \cdot l}{2} \\
 &= \frac{16\pi \cdot 10}{2} \\
 &= 80\pi \\
 TSA &= LSA + 2 \cdot A_{\text{Base}} \\
 &= 80\pi + 2(64\pi) \\
 &= 208\pi \\
 V &= \frac{A_{\text{Base}} \cdot h}{3} \\
 &= \frac{64\pi \cdot 8}{3} = \frac{512\pi}{3}
 \end{aligned}$$

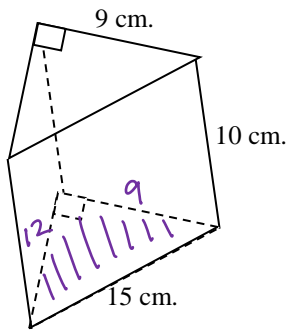
Lateral Area =  $80\pi \text{ cm}^2$

Total Area =  $208\pi \text{ cm}^2$

Volume =  $\frac{512\pi}{3} \text{ cm}^3$

Parallel Cross Section: Circle

6.



$$\begin{aligned}
 LSA &= p \cdot h \\
 &= (9+12+15)10 \\
 &= (36)10 \\
 &= 360 \\
 TSA &= LSA + 2 \cdot A_{\text{Base}} \\
 &= 360 + 2 \left( \frac{9 \cdot 12}{2} \right) \\
 &= 468 \\
 V &= A_{\text{Base}} \cdot h \\
 &= 54 \cdot 10 \\
 &= 540
 \end{aligned}$$

Lateral Area =  $360 \text{ cm}^2$

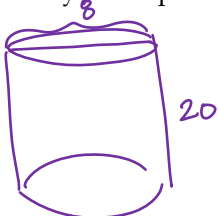
Total Area =  $468 \text{ cm}^2$

Volume =  $540 \text{ cm}^3$

Parallel Cross Section: triangle

7. A right cylindrical tank is 8 ft in diameter and 20 ft tall. How many gallons of paint are needed to paint the tank if one gallon covers 200 sq ft? (note: you are painting the top and the bottom) \* TSA\*

7. 4 gal



$$\begin{aligned}
 TSA &= LSA + 2 \cdot A_{\text{Base}} \\
 &= p \cdot h + 2\pi r^2 \\
 &= 8\pi \cdot 20 + 2\pi(4)^2 \\
 &= 160\pi + 32\pi \\
 &= 192\pi \text{ ft}^2 \text{ or } \approx 603.19 \text{ ft}^2
 \end{aligned}$$

$$\frac{\text{gal}}{\text{sq ft}} \frac{1}{200} = \frac{x}{192\pi}$$

$$x \approx 3.02$$

We would need 4 gal to paint the tank.

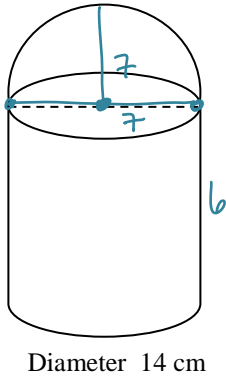
8. If a sphere has a surface area of  $36\pi\text{cm}^2$ , find the volume of the sphere.

Volume =  $36\pi\text{cm}^3$

$$\begin{aligned} \text{TSA} &= 4\pi r^2 \\ 36\pi &= 4\pi r^2 \\ r &= r^2 \\ 3 &= r \end{aligned}$$

$$\begin{aligned} V &= \frac{4\pi r^3}{3} \\ &= \frac{4\pi(3)^3}{3} \\ &= 36\pi \end{aligned}$$

9.



$$\begin{aligned} \text{SA}_{\text{Hem}} &= 2\pi r^2 \\ &= 2\pi(7)^2 \\ &= 98\pi \end{aligned}$$

$$\begin{aligned} \text{LSA}_{\text{Cyl}} &= p \cdot h \\ &= 14\pi \cdot 6 \\ &= 84\pi \end{aligned}$$

$$A_{\text{Base}} = 49\pi$$

$$\begin{aligned} \text{TSA} &= 98\pi + 84\pi + 49\pi \\ \text{TSA} &= 231\pi \end{aligned}$$

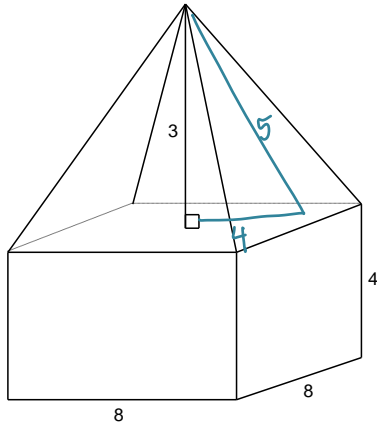
$$\begin{aligned} V_{\text{Hem}} &= \frac{2\pi r^3}{3} \\ &= \frac{2\pi(7)^3}{3} \\ &= \frac{686\pi}{3} \end{aligned}$$

$$\begin{aligned} V_{\text{Cyl}} &= A_{\text{Base}} \cdot h \\ &= 49\pi \cdot 6 \\ &= 294\pi \end{aligned}$$

Surface Area =  $231\pi\text{cm}^2$

Volume =  $\frac{1568\pi}{3}\text{cm}^3$   
or  $\approx 522.67\pi\text{cm}^3$

10.



$$\begin{aligned} \text{LSA}_{\text{Pyr}} &= \frac{p \cdot l}{2} \\ &= \frac{32 \cdot 5}{2} \\ &= 80 \end{aligned}$$

$$\begin{aligned} \text{LSA}_{\text{Prism}} &= p \cdot h \\ &= 32 \cdot 4 \\ &= 128 \end{aligned}$$

$$A_{\text{Base}} = 64$$

$$\begin{aligned} \text{TSA} &= 80 + 128 + 64 \\ \text{TSA} &= 272 \end{aligned}$$

$$\begin{aligned} V_{\text{Pyr}} &= \frac{A_{\text{Base}} \cdot h}{3} \\ &= \frac{64 \cdot 3}{3} \\ &= 64 \end{aligned}$$

$$\begin{aligned} V_{\text{Prism}} &= A_{\text{Base}} \cdot h \\ &= 64 \cdot 4 \\ &= 256 \end{aligned}$$

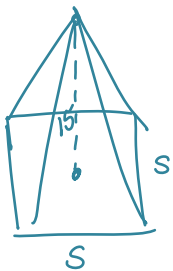
$$\begin{aligned} V &= 64 + 256 \\ V &= 320 \end{aligned}$$

Surface Area =  $272\text{u}^2$

Volume =  $320\text{u}^3$

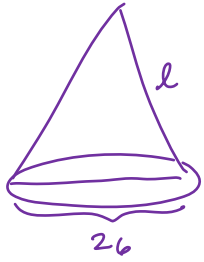
11. The volume of a regular square pyramid is  $1805\text{cm}^3$ . Its height is 15 cm. Find the base edge of the pyramid.

Base edge =  $19\text{cm}$



$$\begin{aligned} V &= \frac{A_{\text{Base}} \cdot h}{3} \\ 1805 &= \frac{s^2 \cdot 15}{3} \\ 1805 &= 5s^2 \\ 361 &= s^2 \\ 19 &= s \end{aligned}$$

12. The surface area of a right circular cone is  $728\pi \text{ cm}^2$  and the diameter is 26 cm. Find the slant height of the cone.



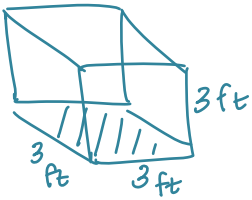
$$\begin{aligned} TSA &= LSA + A_{\text{Base}} \\ &= \frac{p \cdot l}{2} + \pi r^2 \end{aligned}$$

$$728\pi = \frac{26\pi \cdot l}{2} + \pi(13)^2$$

$$\begin{aligned} 728\pi &= 13\pi l + 169\pi \\ 559\pi &= 13\pi \cdot l \rightarrow l = 43 \end{aligned}$$

Slant height = 43 cm

13. Lisa needs to store 8 boxes while she is moving. Each box is a cube with edge length 3 feet. A storage facility charges \$0.75 for every cubic foot of storage per month. Find the amount of money Lisa will pay to store her boxes for one month.



$$V = A_{\text{Base}} \cdot h$$

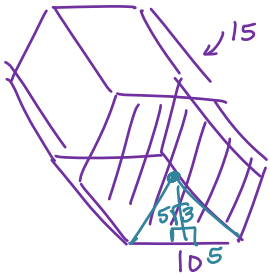
$$= (3 \cdot 3) \cdot 3$$

$$= 27 \text{ ft}^3 \times \$0.75 = \$20.25 \times 8 \text{ boxes} = \$162$$

13. \$162 for the month

14. Find the total surface area and volume of a regular hexagonal prism with a base edge of 10 and a height of 15.

Surface Area =  $(900 + 300\sqrt{3}) \text{ u}^2$



$$\begin{aligned} TSA &= LSA + 2 \cdot A_{\text{Base}} \\ &= p \cdot h + 2 \left( \frac{a \cdot p}{2} \right) \\ &= (10 \cdot 6)15 + 2 \left( \frac{5\sqrt{3} \cdot 60}{2} \right) \\ &= 900 + 300\sqrt{3} \end{aligned}$$

$$\begin{aligned} V &= A_{\text{Base}} \cdot h \\ &= 150\sqrt{3} \cdot 15 \\ &= 2,250\sqrt{3} \end{aligned}$$

Volume =  $2,250\sqrt{3} \text{ u}^3$

15. What would happen to the volume of a cone if the height were doubled?

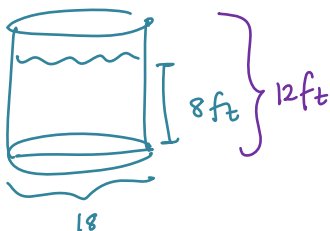
the volume would also double

16. What would happen to the volume of a prism if the length, width and height were tripled?

the volume would be multiplied by 27

17. A right cylindrical water tank 18 ft in diameter contains water to a depth of 8 ft. What volume of water must be added to raise the water level to 12 ft?

17.  $324\pi \text{ ft}^3$



$$\begin{aligned} V &= A_{\text{Base}} \cdot h \\ &= 81\pi \cdot 8 \\ &= 648\pi \end{aligned}$$

$$\begin{aligned} V &= A_{\text{Base}} \cdot h \\ &= 81\pi \cdot 12 \\ &= 972\pi \end{aligned}$$

$$\begin{aligned} &972\pi - 648\pi \\ &324\pi \end{aligned}$$