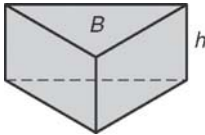
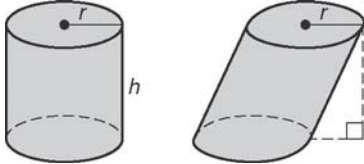
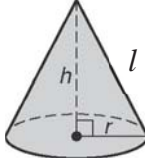
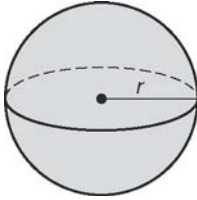
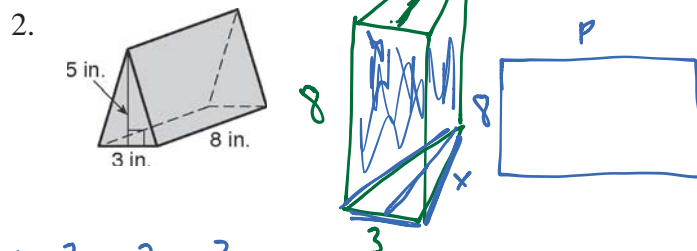
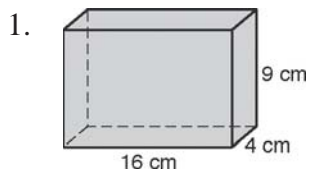


Ch. 11 Extension: **Surface Area**

Prism	$SA = 2B + Ph$	
Cylinder	$SA = 2B + Ch$ $SA = 2\pi r^2 + 2\pi rh$	
Cone	$SA = B + \frac{1}{2}Cl$ $SA = \pi r^2 + \pi rl$	
Sphere	$SA = 4\pi r^2$	

Find the surface area of each prism.

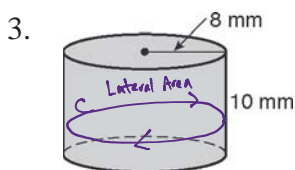


$$1.5^2 + 5^2 = X^2$$

$$2.25 + 25 = X^2 \rightarrow X = \sqrt{27.25}$$

$$SA = 15 + 8(3 + 2\sqrt{27.25}) = 122.52 \text{ in}^2$$

Find the surface area of the cylinder. Give your answer in terms of π .



Lateral Area

$$h=10 \quad A = Ch = 16\pi(10) = 160\pi \text{ mm}^2$$

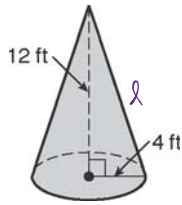
$$C = 2\pi r = 2\pi(8) = 16\pi \text{ mm}$$

$$2(\pi 64) = 128\pi$$

$$\text{Total} = 128\pi + 160\pi = 288\pi \text{ mm}^2$$

Find the surface area of the cone. Give your answer in terms of π .

4.



$$A_{\text{base}} = \pi 4^2 = 16\pi \text{ ft}^2$$

$$A_{\text{TOT}} = 16\pi + 16\pi\sqrt{10} = 16\pi(1 + \sqrt{10}) \text{ ft}^2$$

$$A_{\text{Lat}} = \frac{1}{2} C l = \frac{1}{2} 2\pi(4) \cdot 4\sqrt{10} = 16\pi\sqrt{10}$$

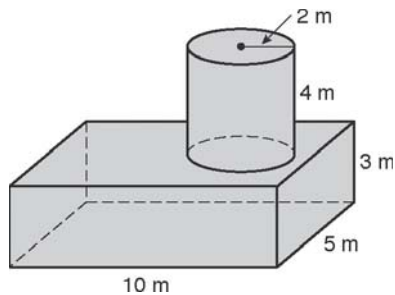
$$4^2 + 12^2 = l^2$$

$$160 = l^2$$

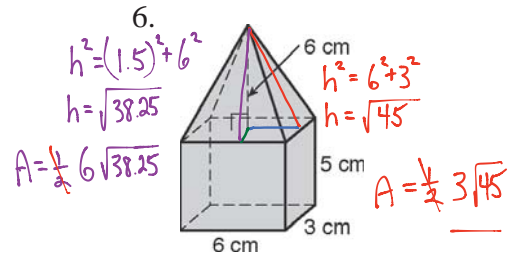
$$l = 4\sqrt{10}$$

Find the surface area of the composite figure.

5.



6.



$$h^2 = (1.5)^2 + 6^2$$

$$h = \sqrt{38.25}$$

$$A = \frac{1}{3} 6\sqrt{38.25}$$

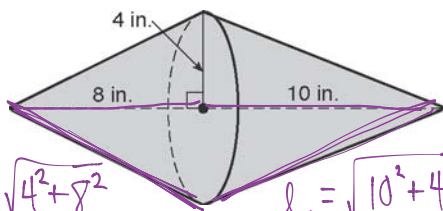
$$h^2 = 6^2 + 3^2$$

$$h = \sqrt{45}$$

$$A = \frac{1}{3} 3\sqrt{45}$$

$$108 + 6\sqrt{38.25} + 3\sqrt{45}$$

7.



$$l_1 = \sqrt{4^2 + 8^2}$$

$$l_1 = \sqrt{80}$$

$$l_1 = 4\sqrt{5}$$

$$l_2 = \sqrt{10^2 + 4^2}$$

$$l_2 = \sqrt{116}$$

$$l_2 = 4\sqrt{19}$$

$$SA_{\text{cone1}} = \frac{1}{2} C l_1 = \frac{1}{2} 2\pi(4) l_1$$

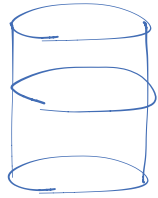
$$SA_{\text{cone2}} = \frac{1}{2} C l_2 = \frac{1}{2} 2\pi(4) l_2$$

$$SA_{\text{cone1}} = \frac{1}{2} 2\pi(4) 4\sqrt{5}$$

$$SA_{\text{cone2}} = \frac{1}{2} 2\pi(4) 4\sqrt{19}$$

$$16\pi\sqrt{5} + 16\pi\sqrt{19} \approx 16\pi(\sqrt{5} + \sqrt{19})$$

8. Find the volume of a cylinder with surface area $210\pi \text{ m}^2$ and height 9 in.



$$A_{\text{cyl}} = 210\pi \text{ m}^2 = \underbrace{2\pi r^2}_B + \underbrace{2\pi r \cdot 9}_L$$

$$= 2\pi r^2 + 18\pi r = 210\pi$$

$$2\pi r^2 + 18\pi r - 210\pi = 0$$

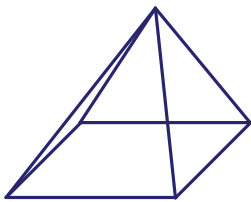
$$\underline{2\pi(r^2 + 9r - 105) = 0}$$

$$r = 6.695 = \frac{-9 \pm \sqrt{81 + 420}}{2}$$

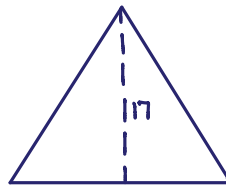
$$V = \pi r^2 h = \pi (6.695)^2 \cdot 9$$

=

9. Find the volume of a square pyramid with slant height 17 in. and surface area 800 in^2 .



32

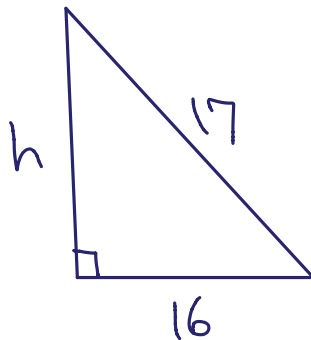


$$800 = 4\left(\frac{1}{2}b(17)\right) + b^2$$

$$b^2 + 34b - 800 = 0$$

$$(b-16)(b+50) = 0$$

$$b = 16 \text{ inches}$$



$$h^2 + 16^2 = 17^2$$

$$h^2 = 289 - 256 = 33$$

$$h = \sqrt{33}$$

$$V = \frac{1}{3} B h = \frac{1}{3} 136(\sqrt{33}) = \frac{136}{3}\sqrt{33} \text{ in}^2$$