

12.3

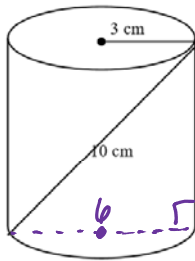
Thursday, April 13, 2017 9:28 AM

Geo H

Name:

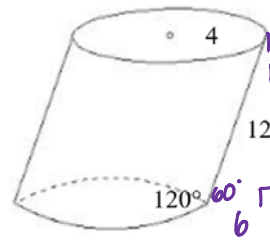
12.3 More surface area formulas

1. a. Given the cylinders, find the lateral area and total surface area.



$$\begin{aligned} LSA &= 6\pi \cdot 8 \\ &= 48\pi \\ TSA &= 48\pi + 2 \cdot \pi \cdot 3^2 \\ &= 48\pi + 18\pi \\ &= 66\pi \end{aligned}$$

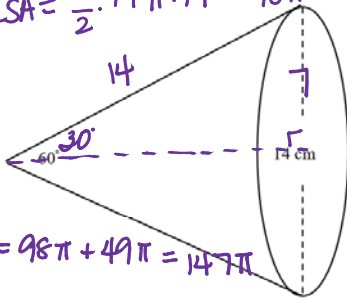
- b.



$$\begin{aligned} LSA &= 8\pi \cdot 6\sqrt{3} \\ &= 48\pi\sqrt{3} \\ TSA &= 48\pi\sqrt{3} + 2 \cdot 4^2\pi \\ &= 48\pi\sqrt{3} + 32\pi \end{aligned}$$

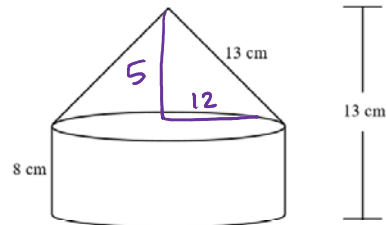
2. Given the solids below, find the total surface area.

a. $LSA = \frac{1}{2} \cdot 14\pi \cdot 14 = 98\pi$



$$TSA = 98\pi + 49\pi = 147\pi$$

- b.



$$\begin{aligned} TSA &= \frac{1}{2} \cdot 24\pi \cdot 13 + 24\pi \cdot 8 + 12^2\pi \\ &= 492\pi \end{aligned}$$

- 3.

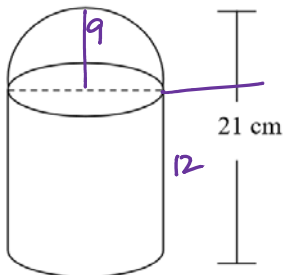
- a. Find the surface area of a sphere with radius of 5.

$$\begin{aligned} SA &= 4 \cdot \pi \cdot 5^2 \\ &= 100\pi \end{aligned}$$

- b. If the surface area of a sphere is $256\pi \text{ in}^2$, find the radius.

$$\begin{aligned} \frac{256\pi}{4\pi} &= \frac{4\pi r^2}{4\pi} & 64 &= r^2 \\ & & \boxed{r} &= \boxed{8} \end{aligned}$$

- c. Given a hemisphere on top of a cylinder, find the surface area.

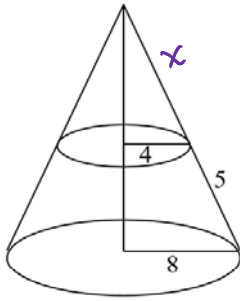


Diameter 18 cm

$$r=9$$

$$\begin{aligned} SA &= \frac{1}{2} \cdot \text{sphere} + LA_{\text{cyl}} + 1 \text{ Circle base} \\ &= \frac{1}{2} \cdot 4\pi \cdot 9^2 + 18\pi \cdot 12 + \pi \cdot 9^2 \\ &= 192\pi + 216\pi + 81\pi \\ &= 489\pi \end{aligned}$$

4. Find the total surface area of the cone below.



$$\frac{4}{8} = \frac{x}{x+5}$$

$$4x + 20 = 8x$$

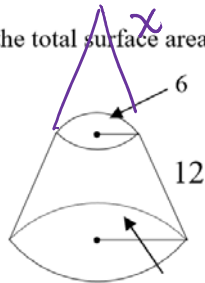
$$4x = 20$$

$$x = 5$$

$$TSA = \frac{1}{2} \cdot 16\pi \cdot 10 + 8^2\pi$$

$$= 144\pi$$

5. Find the total surface area of the frustum:



$$\frac{6}{14} = \frac{x}{x+12}$$

$$14x = 6x + 72$$

$$8x = 72$$

$$x = 9$$

$$TSA = LSA_{big} - LSA_{sm} +$$

$$A_{big\odot} +$$

$$A_{sm\odot}$$

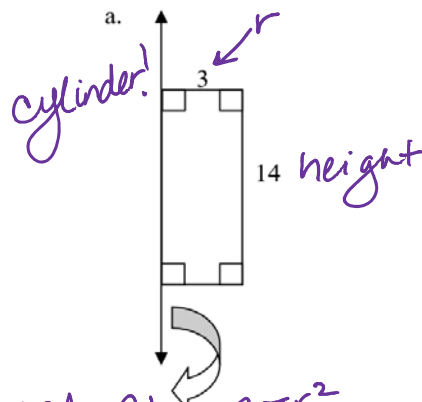
$$= \frac{1}{2} \cdot 28\pi \cdot 21 - \frac{1}{2} \cdot 12\pi \cdot 9$$

$$+ 196\pi + 36\pi$$

$$= 472\pi$$

* creates base on top!

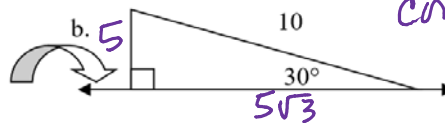
6. Find the total surface area of the solids below found after rotations about an axis.



$$TSA = C \cdot h + 2\pi r^2$$

$$= 6\pi \cdot 14 + 2\pi \cdot 3^2$$

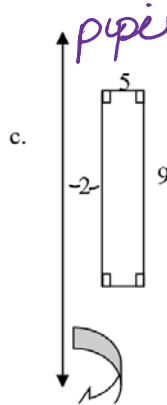
$$= 102\pi$$



$$TSA = \frac{1}{2}Cl + \pi r^2$$

$$= \frac{1}{2}10\pi \cdot 10 + \pi \cdot 5^2$$

$$= 75\pi$$



Big radius = 7
Sm radius = 2

$$TSA = 14\pi \cdot 9 + 4\pi \cdot 9$$

$$+ (49\pi - 4\pi) \cdot 2$$

$$= 252\pi$$

* creates a surface on inside