

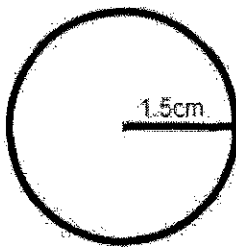
Name: Key

Block: Yahoooo!

Surface Area 6 - Review and Challenges

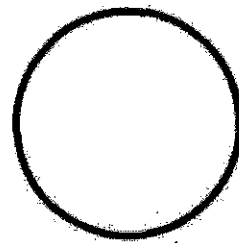
Review problems:

Determine the area and circumference.



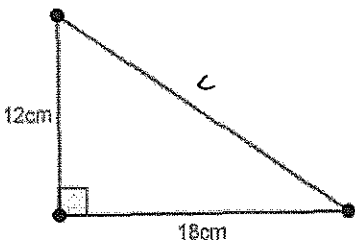
$$\begin{aligned}
 A &= \pi r^2 & C &= 2\pi r \\
 &= \pi (1.5\text{cm})^2 & &= 2\pi (1.5) \\
 &= \pi \cdot 2.25\text{cm}^2 & &= \pi \cdot 3\text{cm} \\
 A &\approx 7.1\text{cm}^2 & C &\approx 9.4\text{cm}
 \end{aligned}$$

Determine the area if the circumference is 120cm



$$\begin{aligned}
 C &= 2\pi r \\
 120\text{cm} &= 2\pi r \\
 \frac{120\text{cm}}{2\pi} &= r \\
 19.1\text{cm} &\approx r \\
 A &= \pi r^2 \\
 &= \pi (19.1\text{cm})^2 \\
 &\approx 1146.1\text{cm}^2
 \end{aligned}$$

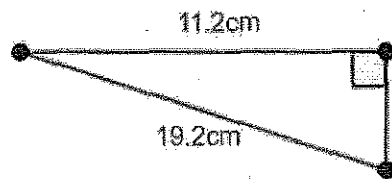
Determine the length of the hypotenuse and the area.



$$\begin{aligned}
 \text{leg}^2 + \text{leg}^2 &= \text{hyp}^2 \\
 (12\text{cm})^2 + (18\text{cm})^2 &= c^2 \\
 144\text{cm}^2 + 324\text{cm}^2 &= c^2 \\
 468\text{cm}^2 &= c^2 \\
 21.6\text{cm} &= c
 \end{aligned}$$

$$\begin{aligned}
 A &= \frac{(12\text{cm})(18\text{cm})}{2} \\
 A &= \frac{216\text{cm}^2}{2} \\
 A &= 108\text{cm}^2
 \end{aligned}$$

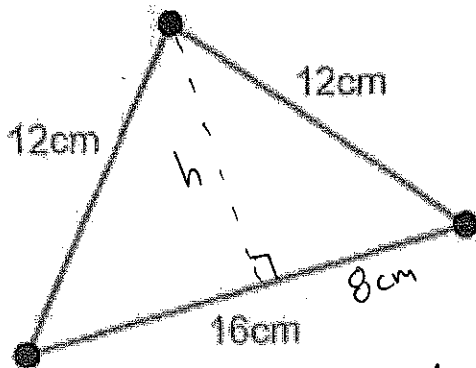
Determine the length of the leg and the area.



$$\begin{aligned}
 \text{leg}^2 + \text{leg}^2 &= \text{hyp}^2 \\
 (11.2\text{cm})^2 + \text{leg}^2 &= (19.2\text{cm})^2 \\
 125.44 + \text{leg}^2 &= 368.64 \\
 \text{leg}^2 &= 243.2\text{cm}^2 \\
 \text{leg} &= 15.6\text{cm}
 \end{aligned}$$

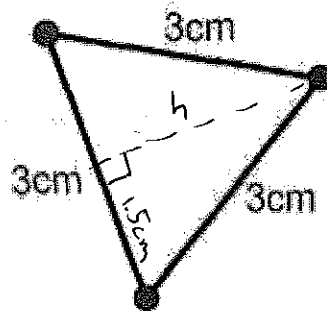
$$\begin{aligned}
 A &= \frac{bh}{2} = \frac{(11.2\text{cm})(15.6\text{cm})}{2} \\
 &= 87.36\text{cm}^2
 \end{aligned}$$

Determine the areas of the triangles.



$$\begin{aligned}
 h^2 + (8\text{cm})^2 &= (12\text{cm})^2 \\
 h^2 + 64\text{cm}^2 &= 144\text{cm}^2 \\
 h^2 &= 80\text{cm}^2 \\
 h &= 8.9\text{cm}
 \end{aligned}$$

$$\begin{aligned}
 A &= \frac{bh}{2} \\
 &= \frac{(16\text{cm})(8.9\text{cm})}{2} \\
 &= 71.2\text{cm}^2
 \end{aligned}$$

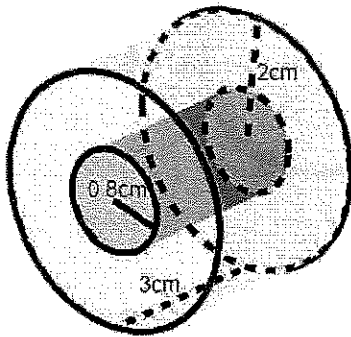


$$\begin{aligned}
 h^2 + (1.5\text{cm})^2 &= (3\text{cm})^2 \\
 h^2 + 2.25\text{cm}^2 &= 9\text{cm}^2 \\
 h^2 &= 6.75\text{cm}^2 \\
 h &= 2.6\text{cm}
 \end{aligned}$$

$$\begin{aligned}
 A &= \frac{bh}{2} \\
 &= \frac{(3\text{cm})(2.6\text{cm})}{2} \\
 &= 3.9\text{cm}^2
 \end{aligned}$$

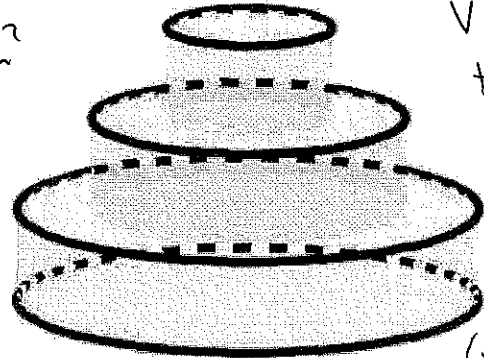
Compute the surface area of each shape to one decimal place. Drawing some pictures may be useful, but not all shapes have foldable nets.

(Each tier has height 10cm and respective radii of 20cm, 14cm, 8cm)



$$SA = 24.52 \pi \text{ cm}^2$$

$$\approx 77 \text{ cm}^2$$



Viewed from the top, it is just a big circle

(you can ignore layers)



So SA is 2 circles + the 3 rectangular sides!

$$C_{\text{top}} = 2\pi(8\text{cm}) = 16\pi \text{ cm}$$

$$C_{\text{mid}} = 2\pi(14\text{cm}) = 28\pi \text{ cm}$$

$$C_{\text{bot}} = 2\pi(20\text{cm}) = 40\pi \text{ cm}$$

$$(O - O) \times 2 + h(\text{small circ.}) + h(\text{large circ.}) = SA$$

$$= (\pi(2\text{cm})^2 - \pi(0.8\text{cm})^2) \times 2 + (3\text{cm})(2\pi(0.8\text{cm})) + (3\text{cm})(2\pi(2\text{cm}))$$

$$= (4\pi \text{ cm}^2 - 0.64\pi \text{ cm}^2) \times 2 + 4.8\pi \text{ cm}^2 + 12\pi \text{ cm}^2$$

$$= (3.36\pi \text{ cm}^2) \times 2 + 16.8\pi \text{ cm}^2 \approx \text{Up top!}$$

(A net will help a lot! Top face is a square, bottom face is a square.)

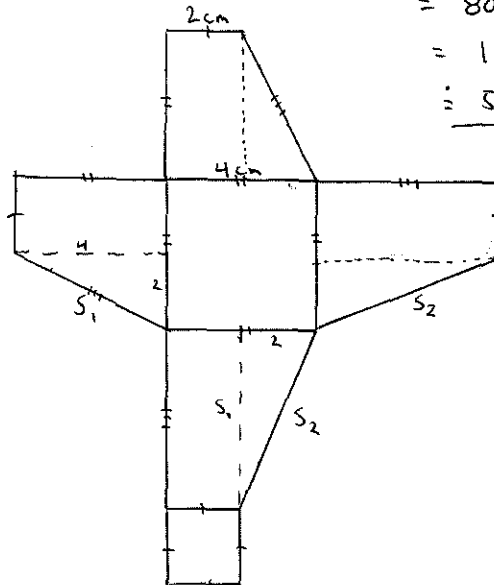
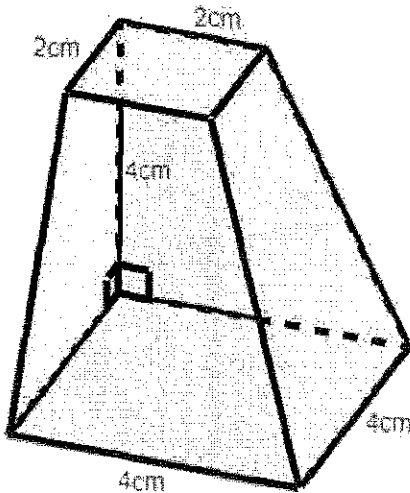
$$SA = 2(\pi(20\text{cm})^2) + (30\text{cm})(16\pi \text{ cm} + 28\pi \text{ cm} + 40\pi \text{ cm})$$

$$= 2(400\pi \text{ cm}^2) + (10\text{cm})(84\pi \text{ cm})$$

$$= 800\pi \text{ cm}^2 + 840\pi \text{ cm}^2$$

$$= 1640\pi \text{ cm}^2$$

$$\approx 5152.2 \text{ cm}^2$$



$$SA = \square + \square + 4\square + 2\Delta + 2\Delta$$

$$= (4\text{cm})^2 + (2\text{cm})^2 + 4(2\text{cm})(4\text{cm})$$

$$+ 2\left(\frac{2\text{cm} \times 4\text{cm}}{2}\right) + 2\left(\frac{2\text{cm} \times 4.47\text{cm}}{2}\right)$$

$$\approx 69 \text{ cm}^2$$

$$S_1^2 = 4^2 + 2^2$$

$$S_1^2 = 16 + 4$$

$$S_1^2 = 20$$

$$S_1 = 4.47 \text{ cm}$$

$$S_2^2 = S_1^2 + 2^2$$

$$S_2^2 = 20 + 4$$

$$S_2^2 = 24$$

$$S_2 = 4.9 \text{ cm}$$