

U1D6_T Surface Area

Friday, September 7, 2018

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U1D6_T
Surface A...

MAP4C1U1D6

Surface Area of Prisms and Cylinders

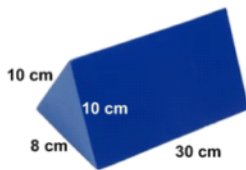
Prism Surface Area:

$$A_{\text{total}} = 2 \times A_{\text{base}} + A_{\text{rectangles}}$$

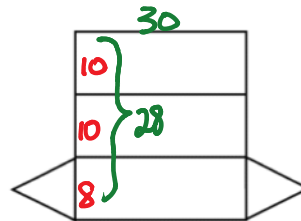
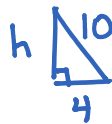
Cylinder Surface Area:

$$A_{\text{total}} = 2\pi r^2 + 2\pi rh$$

Example 1: Calculate the surface area of the following triangular-based prism.



$$\begin{aligned} h^2 &= 10^2 - 4^2 \\ h^2 &= 100 - 16 \\ h^2 &= 84 \\ h &= \sqrt{84} \\ h &\approx 9.165 \end{aligned}$$

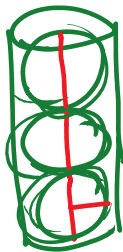


$$\begin{aligned} A_{\text{total}} &= A_{\Delta's} + A_{\square's} \\ &= 2 \times \frac{bh}{2} + lw \end{aligned}$$

$$\begin{aligned} &= 8(9.165) + 28(30) \\ &\approx 913 \text{ cm}^2 \end{aligned}$$

Example 2: Three tennis balls are packaged in a cylindrical container. If each tennis ball has a diameter of 67 mm, what is the minimum amount of material required for the container to the nearest square cm. (Assume no waste, no extra needed for seams.)

$$10\text{mm} = 1\text{cm}$$



$$h = 3 \times 67\text{mm}$$

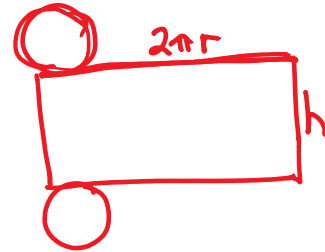
$$h = 201\text{mm}$$

$$h = 20.1\text{cm}$$

$$r = \frac{67}{2}\text{mm}$$

$$r = 33.5\text{mm}$$

$$r = 3.35\text{cm}$$



$$A_{\text{TOTAL}} = A_{\text{circles}} + A_{\text{rect}}$$

$$= 2\pi r^2 + 2\pi rh$$

$$= 2\pi (3.35)^2 + 2\pi (3.35)(20.1)$$

$$= 493.59\dots$$

$$\approx 494\text{cm}^2$$