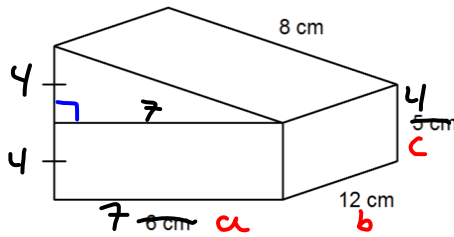


1. This object is composed of a right triangular prism on top of a right rectangular prism. Determine the surface area of the object.



\* Area of rect. prism.  
 \* Area of tri. prism.  
 \* Only calc. exposed faces.

Rect. Prism

$$A = 2ab + 2ac + 2bc$$

$$\begin{aligned} A &= 2(7)(12) + 2(7)(4) + 2(12)(4) \\ &= 168 + 56 + 96 \\ &= \underline{\underline{320}} \text{ cm}^2 \end{aligned}$$

Tri-Prism

$$\text{Back } 4 \times 12 = 48 \text{ cm}^2$$

$$\text{Top } 8 \times 12 = 96 \text{ cm}^2$$

$$\text{Bottom } 12 \times 7 = 84 \text{ cm}^2$$

$$\begin{aligned} A &= 48 + 96 + 84 + 28 \\ &= \underline{\underline{256}} \text{ cm}^2 \end{aligned}$$

Triangles



$$\begin{aligned} &= \frac{1}{2}(\text{base})(\text{height}) \\ &= \frac{1}{2}(4)(7) \\ &= 14 \times 2 = 28 \text{ cm}^2 \end{aligned}$$

Total = rect. Prism +  $\Delta$  prism - overlap<sup>2</sup>

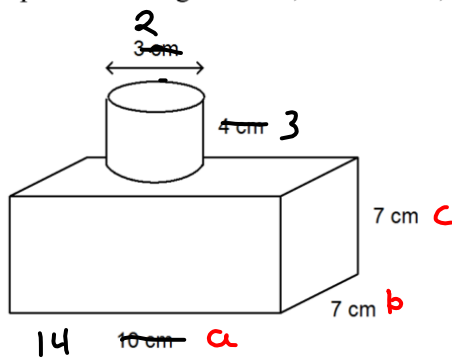
$$\text{Total} = 320 + 256 - (7 \times 12) \times 2$$

$$= 576 - 168 = \boxed{408 \text{ cm}^2}$$

2. Determine the surface area of this composite object, to the nearest square centimetre.

~~The cylinder has diameter 3 cm and height 4 cm.~~

~~The prism has length 10 cm, width 7 cm, and height 7 cm.~~



Rect. Prism

$$\begin{aligned}
 A &= 2ab + 2ac + 2bc \\
 &= 2(14)(7) + 2(14)(7) + 2(7)(7) \\
 &= 196 + 196 + 98 \\
 &= \underline{\underline{490\text{ cm}^2}}
 \end{aligned}$$

Cylinder

$$A = 2\pi r(r+h) \quad \begin{array}{l} r = 1\text{ cm} \\ h = 4\text{ cm} \end{array}$$

$$\begin{aligned}
 &2(3.14)(1)(1+4) \\
 &= 2(3.14)(1)(5)
 \end{aligned}$$

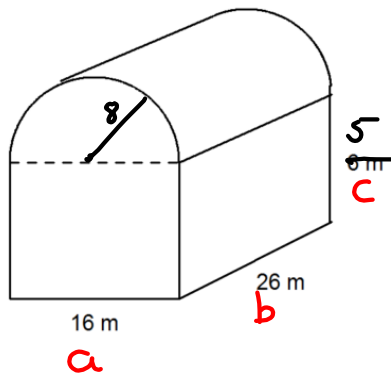
$$A = \underline{\underline{25.12\text{ cm}^2}}$$

$$\text{Total Area} = \text{Rect. prism} + \text{Cylinder} - \text{overlap} \times 2$$

$$= 490 + 25.12 - (\pi r^2) \times 2$$

$$= 515.12 - 6.28 = \boxed{508\text{ cm}^2}$$

3. A barn is built in the shape of a right rectangular prism with a semi-circular roof. Determine the surface area of the barn. Give your answer to the nearest whole number.



Rect. Prism

$$\begin{aligned}
 A &= 2ab + 2ac + 2bc \\
 &= 2(16)(26) + 2(16)(5) \\
 &\quad + 2(26)(5) \\
 &= 832 + 160 + 260 \\
 &= \underline{\underline{1252 \text{ m}^2}}
 \end{aligned}$$

Half-Cylinder

$$r = 8 \text{ m} \quad h = 26 \text{ m}$$

$$\begin{aligned}
 A &= 2\pi r(r+h) \\
 &= 2(3.14)(8)(8+26) \\
 &= 2(3.14)(8)(34) \\
 &= 1708 \text{ m}^2 \leftarrow \text{full cylinder, divide by 2}
 \end{aligned}$$

$$A = \frac{1708}{2} = \underline{\underline{854 \text{ m}^2}}$$

$$\text{Total} = 1252 + 854 - \text{overlap}$$

$$= 1252 + 854 - (16 \times 26)$$

$$= 1252 + 854 - 416$$

$$\boxed{= 2522 \text{ m}^2}$$