

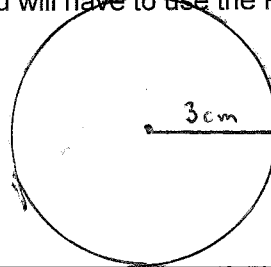
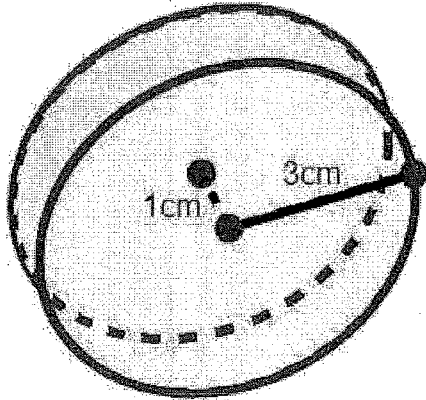
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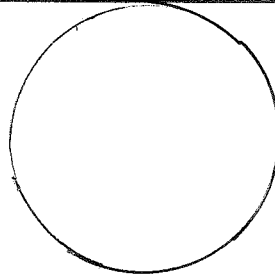
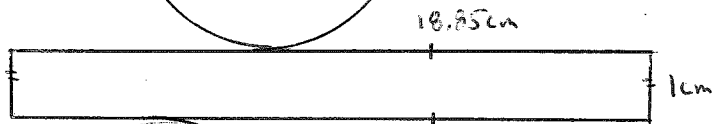
Surface Area 5 - Nets and Surface Area

Draw proportional nets for the following shapes. Appropriate measurements should be included for each side-length, with hash marks to indicate equal side-lengths. Then, compute the surface area of each shape to one decimal place. You will have to use the Pythagorean Theorem.

(cylinder)

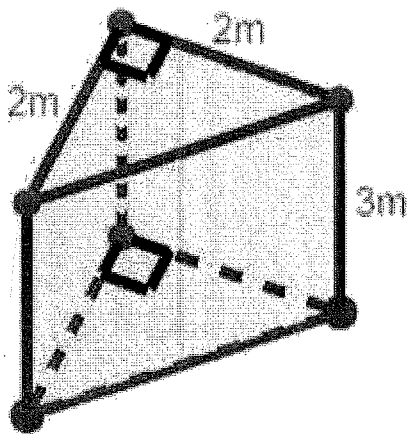


$$\begin{aligned} C &= 2\pi r \\ &= 2\pi(3\text{cm}) \\ &\approx 18.85\text{cm} \end{aligned}$$



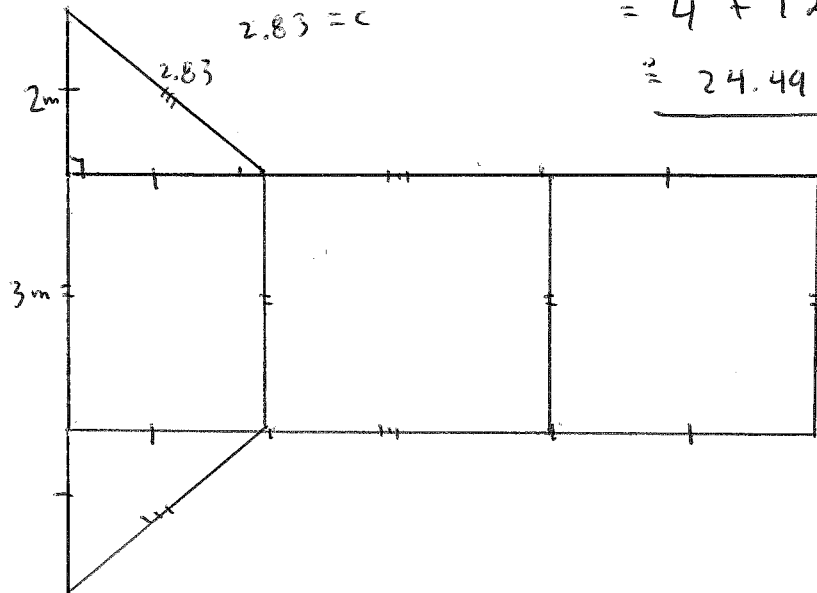
$$\begin{aligned} SA &= 2O + \text{rectangle} \\ &= 2\pi r^2 + lw \\ &\approx 2\pi(3\text{cm})^2 + (18.85\text{cm})(1\text{cm}) \\ &\approx \underline{75.4\text{cm}^2} \end{aligned}$$

(right triangular prism) Find the missing side-length!
Make sure you have **right triangles**!

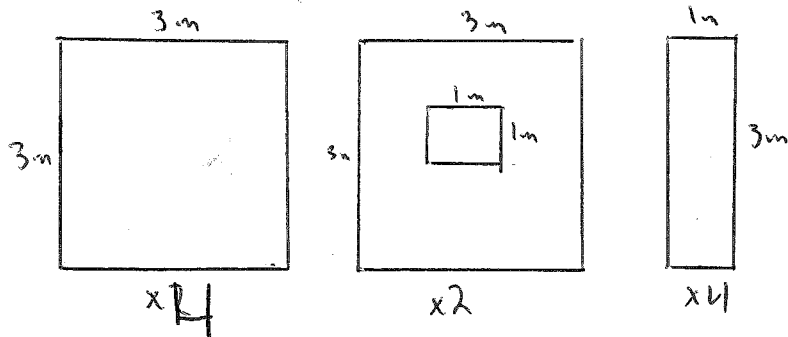
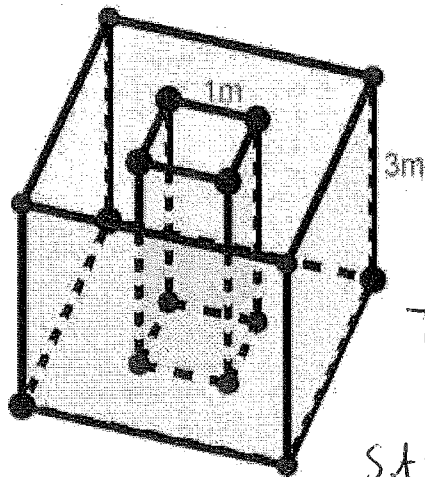


$$\begin{aligned} 2^2 + 2^2 &= c^2 \\ 4 + 4 &= c^2 \\ 8 &= c^2 \\ 2.83 &= c \end{aligned}$$

$$\begin{aligned} SA &= 2\triangle + 2\square + \square \\ &= 2\left(\frac{2 \times 2}{2}\right) + 2(2 \times 3) + (3 \times 2.83) \\ &= 4 + 12 + 8.49 \\ &= \underline{24.49\text{cm}^2} \end{aligned}$$



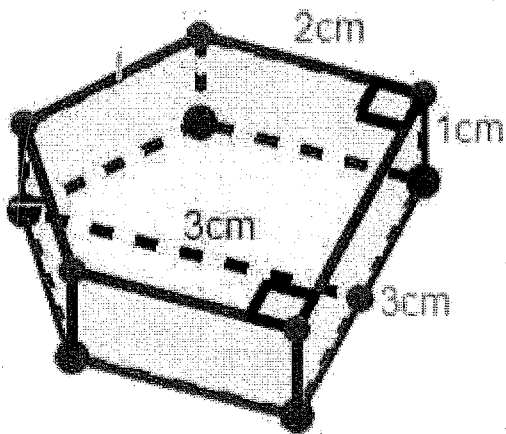
A 3m cube has had 1m square cut in the centre of one of its faces and punched straight through to the opposite side. Determine the surface area of the new 3D shape with the square prism-shaped hole.



The shape can be broken down like this!

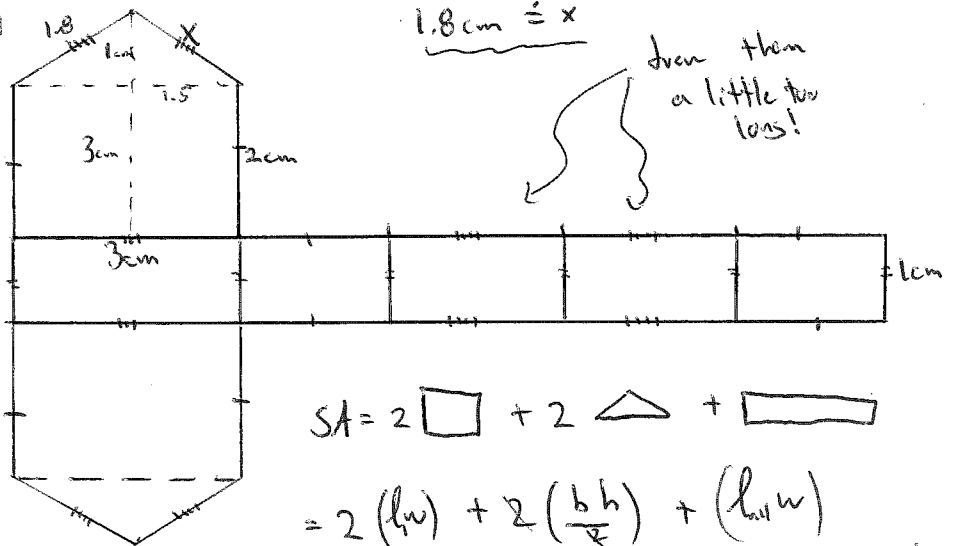
$$\begin{aligned}
 SA &= 4(3 \times 3) + 2(3 \times 3 - 1 \times 1) + 4(1 \times 3) \\
 &= 4(9) + 2(8) + 4(3) \\
 &= 36 + 16 + 12 \\
 &= \underline{64 \text{ m}^2}
 \end{aligned}$$

(pentagonal prism) Note that this is not a regular pentagon, but the two slanted side-lengths are equal.



$$\begin{aligned}
 (1\text{cm})^2 + (1.5\text{cm})^2 &= x^2 \\
 1\text{cm}^2 + 2.25\text{cm}^2 &= x^2 \\
 3.25\text{cm}^2 &= x^2 \\
 \underline{1.8\text{cm}} &= x
 \end{aligned}$$

draw them a little too long!



$$\begin{aligned}
 SA &= 2 \square + 2 \triangle + \text{rectangle} \\
 &= 2(lw) + 2\left(\frac{bh}{2}\right) + (l_1w) \\
 &= 2(2 \times 3) + (3 \times 1) + (3 + 2 + 2 + 1.8 + 2)(1 \times 3) \\
 &= 12 + 3 + \cancel{10.6} \\
 &= \underline{\underline{25.6 \text{ cm}^2}}
 \end{aligned}$$