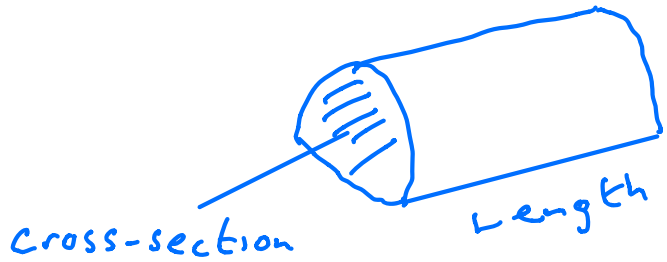
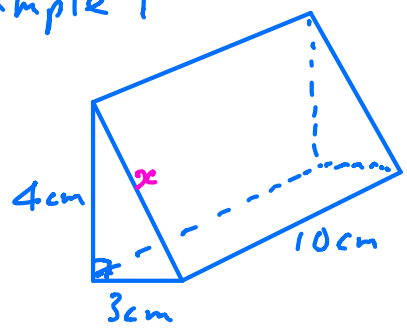
Surface Area and Volume

Volume of a Prism = Area of Cross-section × Length



Example 1



Triangular Prism

Find Volume

= Area of Triangle × Length

$\frac{1}{2} \times 3 \times 4 \times 10$

$= 60 \text{ cm}^3$

Find Surface Area

Pythagoras $3^2 + 4^2 = x^2$

$9 + 16 = x^2$

$25 = x^2$

$\sqrt{25} = x$

$x = 5\text{cm}$

Surface Area consists of 2 triangles and 3 rectangles

$\Delta \quad \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$

Total Surface Area

$10 \times 3 = 30$

$10 \times 4 = 40$

$10 \times 5 = 50$

$\Delta = 6$

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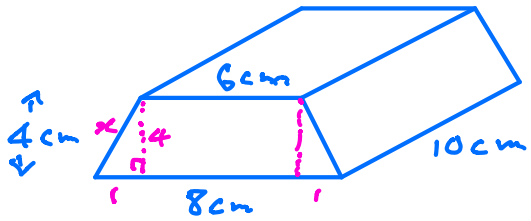
132

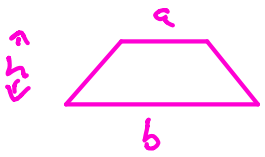
132 cm^2

Example 2



Trapezium Cross-Section

Area of Trapezium



$$\text{Area} = \frac{1}{2}(a+b)h$$

Find Volume

$$\text{Area of Trapezium} = \frac{1}{2}(8+6)\times 4 = 28\text{ cm}^2$$

$$\text{Volume} = 28\times 10 = 280\text{ cm}^3$$

Surface Area

$$x^2 = 1^2 + 4^2$$

$$x^2 = 17$$

$$x = \sqrt{17} = 4.12\text{ cm}$$

Total Surface Area

$10 \times 4.12 = 41.2$

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$10 \times 8 = 80$

$10 \times 6 = 60$

 $= 28$

 $= 28$

278.4 cm^2