Use the π key unless a question says otherwise. Give answers to one decimal place where they are not exact.

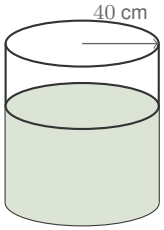
1 A solid of volume 600 cm^3 is lowered into a tank whose cross-section has area 200 cm^2, until it is completely covered.

(a) **Explain why the water level rises.** (2)

(b) Find the rise in the water level (2)

(4 marks)

2 A cylindrical tank has radius 40 cm and contains water. A solid cube of side 50 cm is lowered in until it is completely covered.



(a) Find the volume of the cube (1)

(b) Find the area of the tank's cross-section (2)

(c) Find the rise in the water level (2)

(d) **The tank is 80 cm across. Explain why the cube fits.** (2)

(7 marks)

3 A disc has diameter 12 cm and thickness 1 mm. It has a circular hole through its centre. The volume of the disc is 11.13 cm^3.

(a) **Convert the thickness to centimetres.** (1)

(b) Find the area of the cross-section (2)

(c) Find the area of the outer circle (1)

(d) **Find the diameter of the hole.** (3)

(7 marks)