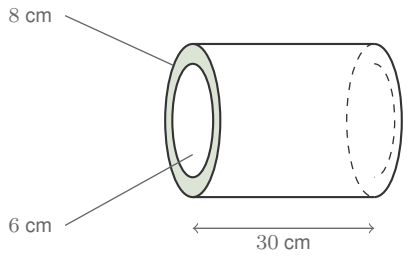
Use the π key unless a question says otherwise. Give answers to one decimal place where they are not exact.

1 A pipe has outer radius 8 cm, inner radius 6 cm and length 30 cm. Find the volume of material in the pipe.



(a) Write down the shape of the cross-section (1)

(b) Find its area (3)

(c) Find the volume (2)

(6 marks)

2 A concrete pipe has outer radius 30 cm, inner radius 25 cm and length 2 m.

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

(b) Find the area of the cross-section (3)

(c) Find the volume of concrete, in cm^3 (2)

(6 marks)

3 A rectangular box has outside measurements 20 cm by 15 cm and is 40 cm long. The walls are 2 cm thick all the way round, and the box is open at both ends.

(a) Find the area of the outer rectangle (1)

(b) Find the area of the inner rectangle (2)

(c) Find the volume of material (2)

(5 marks)

4 A cylindrical hole of radius 3 cm is drilled all the way through a cuboid 10 cm by 10 cm by 12 cm, perpendicular to the 10×10 face.

(a) Find the area of the cross-section that remains (3)

(b) Find the volume of the solid that remains (2)

(5 marks)