4 Fig. 4.1 shows a metal cylinder of height 4.5 cm and base area 24 cm^2.
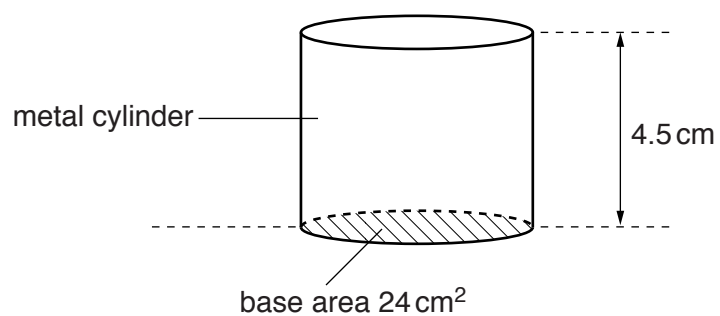

metal cylinder

4.5 cm

base area 24 cm^2

Fig. 4.1

The density of the metal is 7900 kg m^{-3}.

(a) Show that the mass of the cylinder is 0.85 kg.

[2]

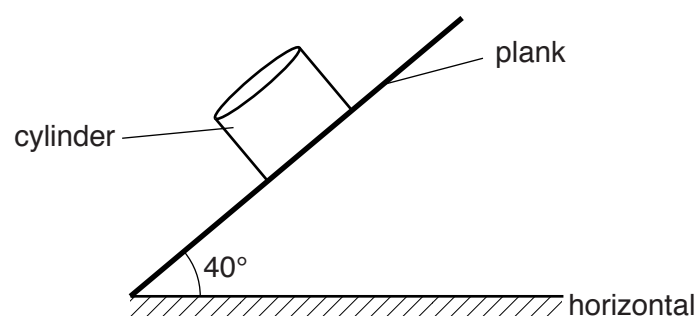**(b)** The cylinder is placed on a plank, as shown in Fig. 4.2.

plank

cylinder

40°

horizontal

Fig. 4.2

The plank is at an angle of 40° to the horizontal.

Calculate the pressure on the plank due to the cylinder.

pressure = ... Pa [3]

(c) The cylinder then slides down the plank with a constant acceleration of $3.8\,\mathrm{m\,s^{-2}}$.
A constant frictional force *f* acts on the cylinder.

Calculate the frictional force *f*.

f = ... N [3]