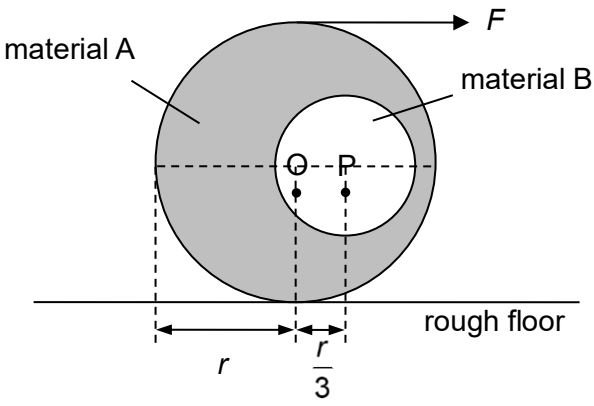
5 A cylinder of radius r, made of material A and B, is placed on a rough floor as shown. The portion made of material B has a radius of $0.45r$ and a density of ρ that is half that of material A. O is the centre of the cylinder and P is the centre of the portion made of material B. The distance between O and P is $\frac{r}{3}$. If the cylinder is entirely made of material A, its weight is 90 N.

A force F is applied horizontally to the top of the cylinder so that O and P are at the same height from the floor as shown.



What is the force F required to keep the cylinder in this equilibrium position?

A 1.5 N **B** 2.0 N **C** 4.5 N **D** 7.5 N