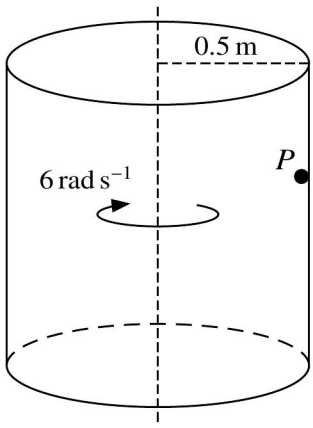

A hollow cylinder with a rough inner surface has radius 0.5 m. A particle P of mass 0.4 kg is in contact with the inner surface of the cylinder. The particle and cylinder rotate together with angular speed 6 rad s^{-1} about the vertical axis of the cylinder, so that the particle moves in a horizontal circle (see diagram). Given that P is about to slip downwards, find the coefficient of friction between P and the surface of the cylinder. [4]