3 A cylindrical disc of mass 0.24 kg has a circular cross-sectional area A, as shown in Fig. 3.1.

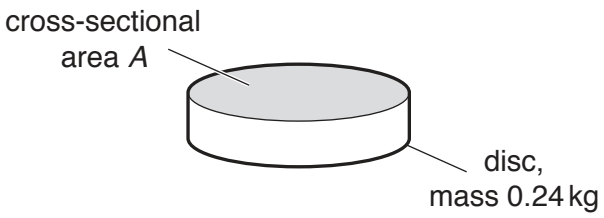

Fig. 3.1

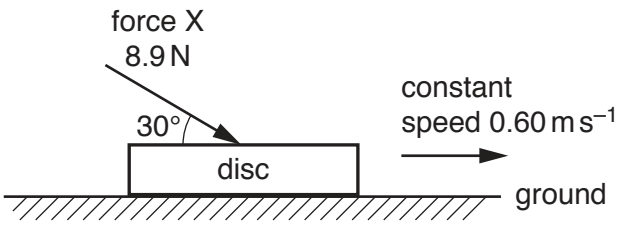

Fig. 3.2

The disc is on horizontal ground, as shown in Fig. 3.2. A force X of magnitude 8.9 N acts on the disc in a direction of 30° to the horizontal. The disc moves at a constant speed of 0.60 m s^{-1} along the ground.

(a) Determine the rate of doing work on the disc by the force X.

rate of doing work = ... W [2]

(b) The force X and the weight of the disc exert a combined pressure on the ground of 3500 Pa.

Calculate the cross-sectional area A of the disc.

A = ... m^2 [3]

(c) Newton's third law describes how forces exist in pairs. One such pair of forces is the weight of the disc and another force Y. State:

(i) the direction of force Y

.....[1]

(ii) the name of the body on which force Y acts.

.....[1]

[Total: 7]