

- 1 A uniform metal rod AB of mass 1.2 kg and length 0.40 m is pivoted at end A. End B is suspended by a light spring as shown in Fig. 1.1. The other end of the spring is supported at X.

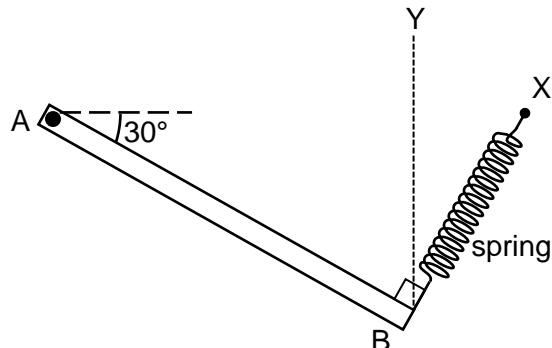


Fig. 1.1

When the rod is in equilibrium, it makes an angle of 30° below the horizontal and lies stationary with the axis of the spring perpendicular to the rod.

- (a) On Fig. 1.2, draw a labelled diagram showing the forces acting on the rod.

Label the forces clearly.

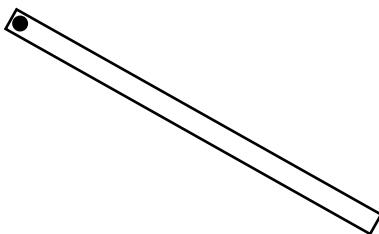


Fig. 1.2

[1]

- (b) Calculate the tension in the spring.

tension = N [2]

- (c) Determine the magnitude of the reaction force at pivot A.

force = N [3]

- (d) The spring in Fig. 1.1 is now replaced with a spring of larger spring constant and of same natural length.

State the change in angle, if any, between the rod and the spring.

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[1]

[Total: 7]