



Alternative approach to 2: just consider GPE (as KE goes from 0  $\rightarrow$  0)

3. A light elastic spring, of natural length 1m and modulus of elasticity 20N, has one end attached to a fixed point A. A particle of mass 2kg is attached to the other end of the spring and is held at a point B which is 0.8m vertically below A. The particle is projected vertically downwards from B with speed  $2\text{ms}^{-1}$ . Find the distance it falls before first coming to rest.

4. A light elastic spring, of natural length  $0.5\text{m}$  and modulus of elasticity  $10\text{N}$ , has one end attached to a point  $A$  on a rough horizontal plane. The other end is attached to a particle  $P$  of mass  $0.8\text{kg}$ . The coefficient of friction between the particle and the plane is  $0.4$ . The particle initially lies on the plane with  $AP = 0.5\text{m}$  and is then projected with speed  $2\text{ms}^{-1}$  away from  $A$ , along the plane. Find the distance travelled by  $P$  before it first comes to rest.