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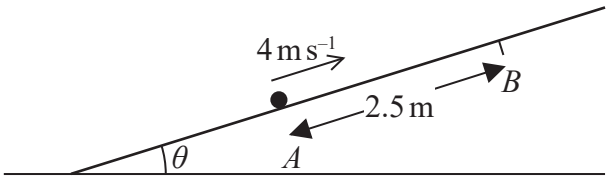


Figure 1

A rough straight ramp is fixed to horizontal ground. The ramp is inclined at an angle θ to the horizontal, where $\sin\theta = \frac{1}{7}$. The points A and B are on a line of greatest slope of the ramp with $AB = 2.5\,\text{m}$ and B above A, as shown in Figure 1. A package of mass 2 kg is projected up the ramp from A with speed $4\,\text{m s}^{-1}$ and first comes to instantaneous rest at B. The coefficient of friction between the package and the ramp is μ. The package is modelled as a particle.

Use the work-energy principle to find the value of μ.

(6)

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Question 2 continued

Q2

(Total 6 marks)