18 Block *A*, of mass 0.2 kg, lies at rest on a rough plane.
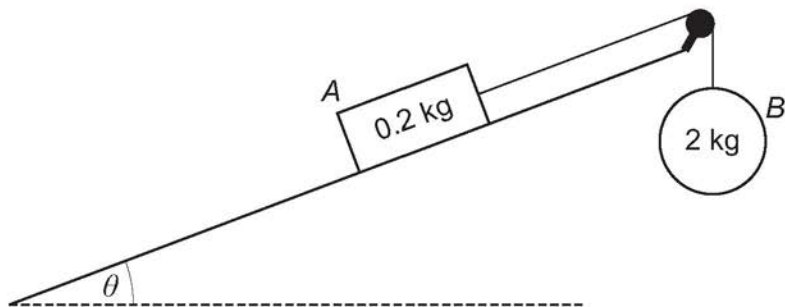
The plane is inclined at an angle θ to the horizontal, such that $\tan\theta = \dfrac{7}{24}$

A light inextensible string is attached to *A* and runs parallel to the line of greatest slope until it passes over a smooth fixed pulley at the top of the slope.

The other end of this string is attached to particle *B*, of mass 2 kg, which is held at rest so that the string is taut, as shown in the diagram below.

18 (a) *B* is released from rest so that it begins to move vertically downwards with an acceleration of $\dfrac{543}{625}g\,\mathrm{m\,s^{-2}}$

Show that the coefficient of friction between *A* and the surface of the inclined plane is 0.17

[8 marks]

18 (b) **In this question use $g = 9.81\,\mathrm{m\,s^{-2}}$**

When *A* reaches a speed of $0.5\,\mathrm{m\,s^{-1}}$ the string breaks.

18 (b) (i) Find the distance travelled by *A* after the string breaks until first coming to rest.

[4 marks]

18 (b) (ii) State an assumption that could affect the validity of your answer to part **(b)(i)**.

[1 mark]