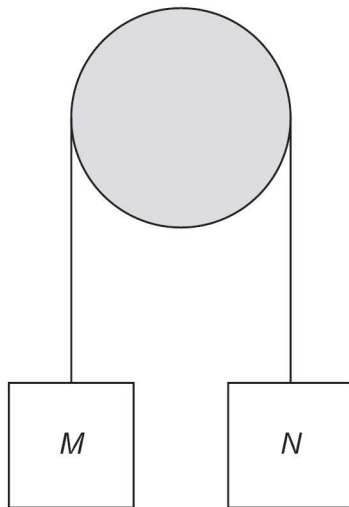


19 Two objects, M and N , are connected by a light inextensible string that passes over a smooth peg.

M has a mass of 0.6 kilograms.

N has a mass of 0.5 kilograms.

M and N are initially held at rest, with the string taut, as shown in the diagram below.



M and N are released at the same instant and begin to move vertically.

You may assume that air resistance can be ignored.

19 (a) It is given that M and N move with acceleration $a \text{ m s}^{-2}$

By forming two equations of motion show that

$$a = \frac{1}{11}g \quad \text{[5 marks]}$$

19 (b) The speed of N , 0.5 seconds after its release, is $\frac{g}{k} \text{ m s}^{-1}$ where k is a constant.

Find the value of k [2 marks]

19 (c) State one assumption that must be made for the answer in part (b) to be valid. [1 mark]