2 A cantilever is set up on a rough table using a rigid uniform metre rule of mass 0.11 kg, a 1.5 kg block and a 5.0 g mass as shown in Fig. 2.1.

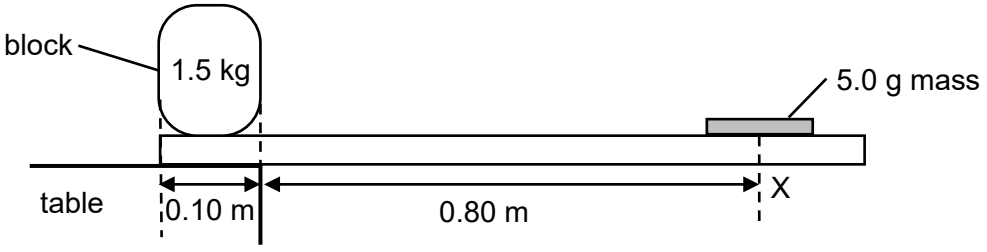

Fig. 2.1

(a) Determine the maximum number of 5.0 g masses that can be stacked above point X such that the cantilever does not topple.

maximum number = ... [3]

(b) The structure in Fig. 2.1 is modified by adding an inextensible string that passes over a frictionless pulley with its ends tied to the 1.5 kg block and to the centre of the metre rule as shown in Fig. 2.2. The string remains taut.

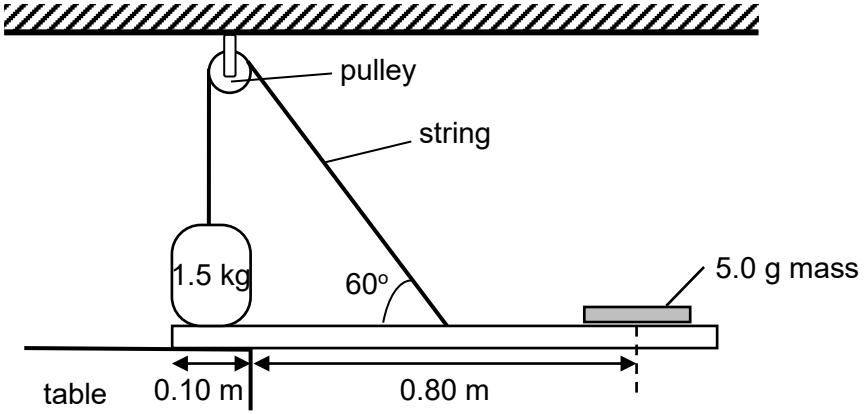

Fig. 2.2

State and explain how this modification will affect your answer in **(a)**.

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..... [3]

[Total: 6]