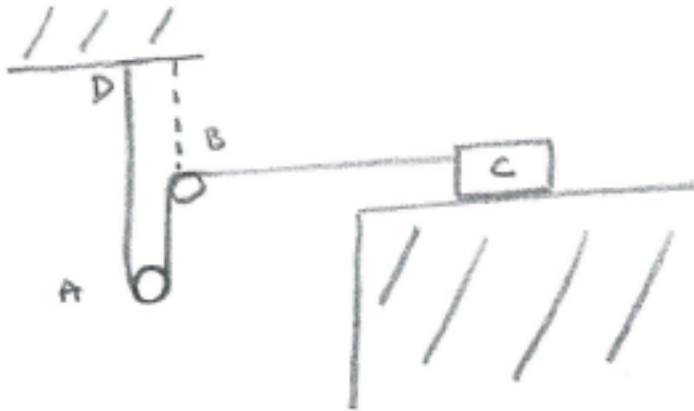


Pulley Exercises (2 pages; 11/3/17)

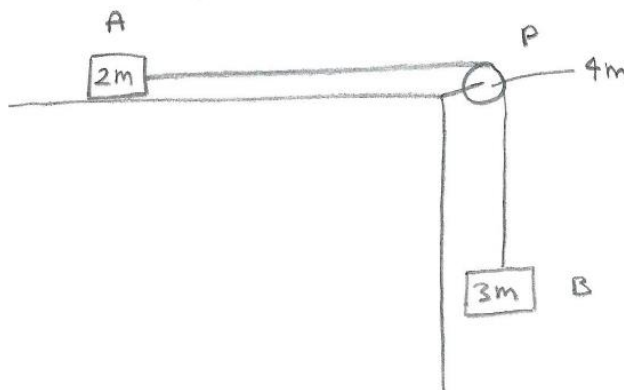
(1)



Referring to the diagram, A is a smooth pulley of mass 2 kg, which can move up and down; B is a smooth, fixed pulley, and C is a block of mass 1 kg, which is initially held at rest on a table. A light inextensible rope is fixed at D, and leads to C, via the two pulleys.

C is now released and accelerates at 2 ms^{-1} . Find the coefficient of friction, μ between C and the table.

(2) Rotating Pulley



Initially block A is held at rest on a smooth table. The pulley P can rotate freely. The string leading from A to B , passing over P , is light and inextensible.

The pulley is a uniform disc of radius r , and the blocks can be modelled as particles.

Block A is released. The tension in the section of the string AP is T_A and in PB it is T_B .

Assuming that the string does not slip on the pulley, and that A does not reach P ,

- (i) Show that the angular acceleration of the pulley is $\frac{3g}{7r} \text{ rad s}^{-2}$
- (ii) Find T_A and T_B in terms of m and g .