

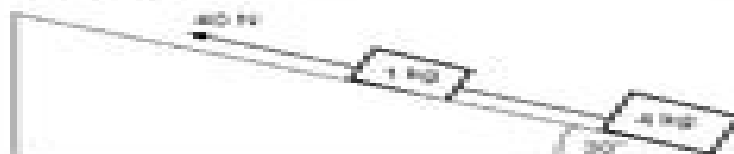
PHYSICAL SCIENCES P1 REVISION DOCUMENT

NEWTON'S LAWS

State the following laws:

1. Newton's second law of motion
2. Newton's law of universal gravitation

QUESTION 2



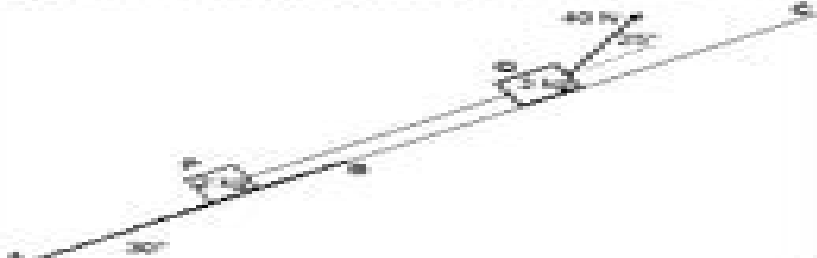
A block of mass 1 kg is connected to another block of mass 4 kg by a light inextensible string. The 1 kg block is on the inclined plane, by means of a constant 40 N force parallel to the plane as shown in the diagram below. The magnitude of the kinetic frictional force between the surface and the 4 kg block is 10 N. The coefficient of kinetic friction between the 1 kg block and the surface is 0,20.

- 2.1 State Newton's third law of motion in words. (2)
- 2.2 Draw a labelled free-body diagram showing ALL the forces acting on the 1 kg block as it moves up the incline. (5)
- 2.3 Calculate the magnitude of the:
 - 2.3.1 Kinetic frictional force between the 1 kg block and the surface (2)
 - 2.3.2 Tension in the string connecting the two blocks (5)

[14]

QUESTION 15

Block P, of mass 2 kg, is connected to block Q, of mass 3 kg, by a light inextensible string. Both blocks are on a plane inclined at an angle of 30° to the horizontal. Block Q is pulled by a constant force of 40 N at an angle of 25° to the incline.



Block P moves on a rough section, AB, of the incline, while block Q moves on a frictionless section, BC, of the incline. See diagram.

An average constant frictional force of 2,5 N acts on block P as it moves from A to B up the incline.

- 15.1 State Newton's Second Law in words. (2)
- 15.2 Draw a labelled free-body diagram for block P. (4)
- 15.3 Calculate the magnitude of the acceleration of block P while block P is moving on section AB. (8)

- 15.4 If block P has now passed point B, how will its acceleration compare to that calculated in QUESTION 15.3? Choose from: GREATER THAN, SMALLER THAN, or EQUAL TO. Give a reason for the answer. (2)

[14]

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