

EXAM: WORK & ENERGY

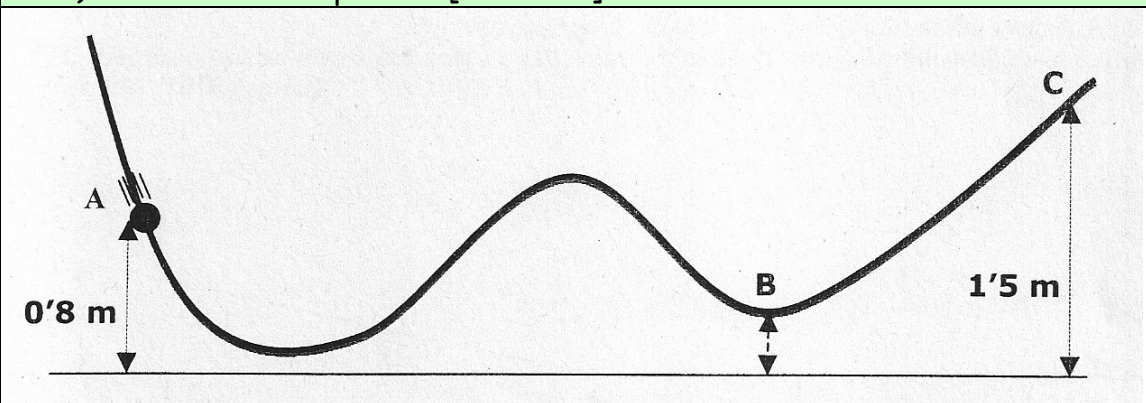
Name:

Course:

Exercise #1

In the frictionless path below, a body moves to C and back. C is the highest point reached by the body. The speed at point B is 5 m/s. Determine:

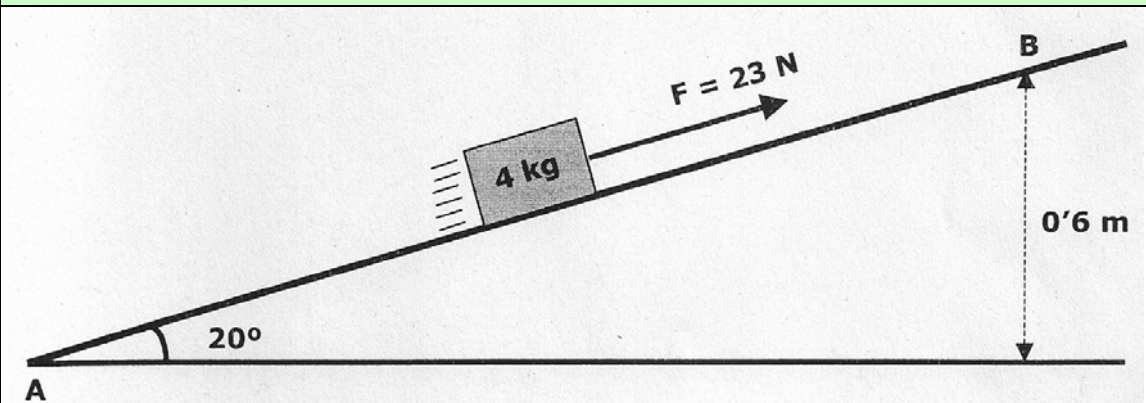
- the speed at point A [1.5 POINTS]
- the altitude at point B [1 POINT]



Exercise #2

The body in motion starts from A (at rest) and moves to B in a frictionless path under the action of an external constant force of 23 N. Determine:

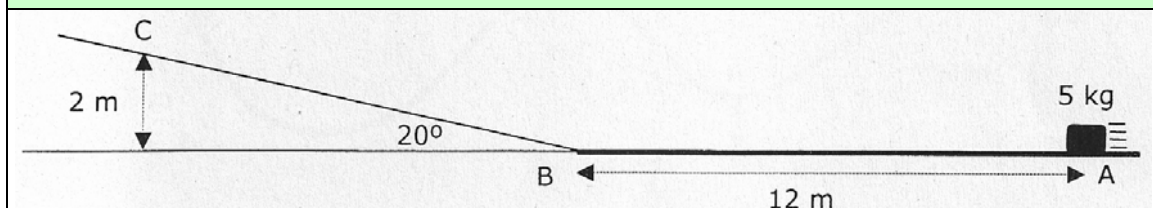
- the value of the work done by each individual force from A to B [1 POINT]
- the speed of the body at point B (apply the work-energy theorem) [1 POINT]
- has the mechanical energy of the body changed or remains constant? Explain briefly your answer. [0.5 POINTS]



Exercise #3

A body moves from A to B and C. Its initial speed is 8 m/s. There is a friction force between A and B, but from B to C the path is frictionless. C is the highest point reached and at that point the body starts moving backwards. Determine:

- the friction coefficient in the path AB [2 POINTS]
- will the body reach again the initial point A? [0.5 POINTS]



Exercise #4

An electric heating system heats 1.5 L of water from 19°C to 76°C in 4 minutes. Consider the system 100% efficient, without any loss of heat. The voltage applied is 220 V. Determine:

- the power of this heating system [1.5 POINTS]
- the current and the resistance of this system [1 POINT]

Density of water = 1 kg/L

Specific heat capacity of water = 4180 J/kg*°C