

DYNAMICS: MOCK EXAM

Name: _____

Group: _____

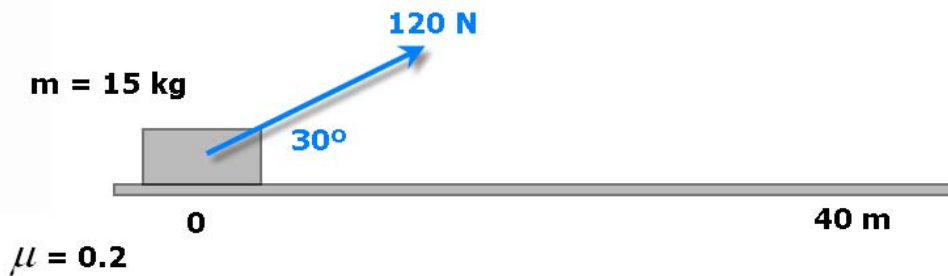
1

An external force of 120 N is exerted on the body, as indicated in the picture, along the first 40 m. Initially, the body is at rest.

Determine:

- the value of the normal force (0.50 POINTS)
- the acceleration of the body (1.50 POINTS)
- the velocity at the point $x = 40 \text{ m}$ (0.50 POINTS)

Estimated time: 15 min

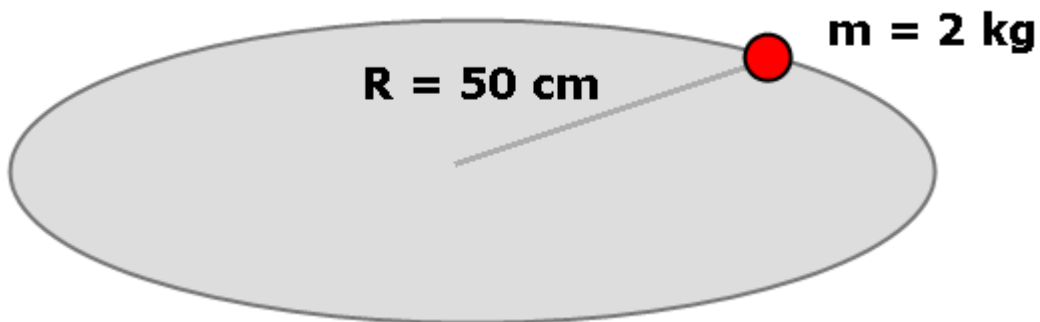


2

A tension force is responsible for keeping a body moving along a circular path, as shown in the picture. The value of the tension is 40 N. Determine:

- the acceleration (0.50 POINTS)
- both velocities: linear and angular (in rad/s and rpm) (1 POINT)
- the period (0.25 POINTS)
- the frequency (0.25 POINTS)
- the distance travelled by the body in 15 s (0.50 POINTS)

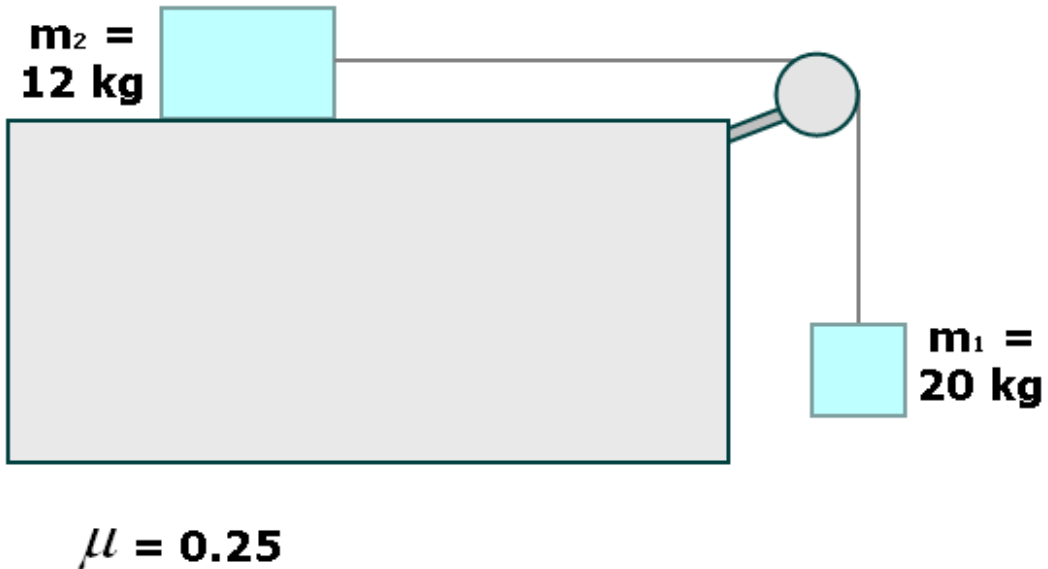
Estimated time: 10 min



3 In the system below, determine:

- the value of the friction force (0.5 POINTS)
- the acceleration of the system (1 POINT)
- the value of the tension (1 POINT)

Estimated time: 10 min



4 An AB system is moving to the right at a speed of 5 m/s. In order to move quicker a force $\vec{F} = 20 \vec{i}$ (N) is applied during 6 seconds. Suddenly, as a result of an explosion, the system is split in two parts and the "B" part of the system starts moving to the right at a velocity of 20 m/s.

Determine:

- the impulse on that system due to the force applied (0.5 POINTS)
- the final linear momentum of the system before the explosion (1 POINT)
- the velocity of "A" after the explosion (1 POINT)

Estimated time: 10 min

