

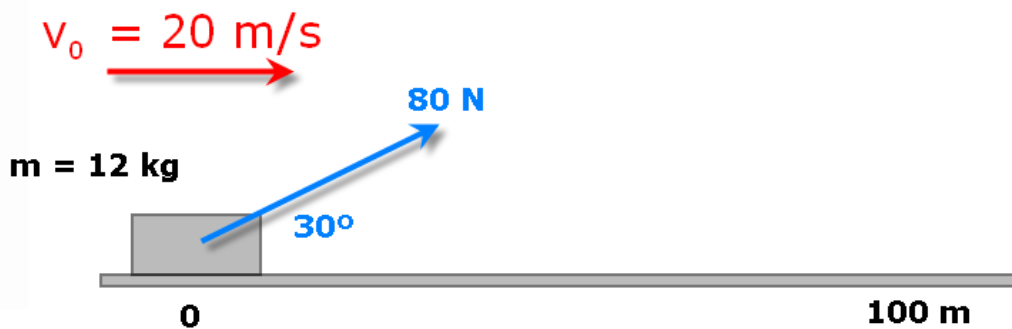
EXAM: DYNAMICS

Name: _____

Group: _____

- 1** A body is moving according to the picture below. Initially, this body is moving at a speed of 20 m/s. Determine:
- The value of the normal force (0.50 POINTS)
 - The values of the friction force and friction coefficient (1 POINT)
 - The velocity of the body when its position is $x = 100$ m (the first time it reaches the position) (1 POINT)

2.5 POINTS
ESTIMATED TIME: 15 min

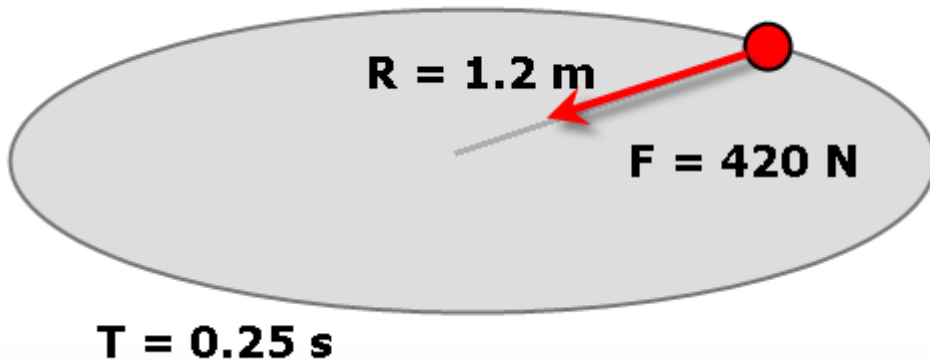


$a = -1.2 \text{ m/s}^2$

- 2** A body is rotating due to a centripetal force of 420 N. The radius of the circle is $R=1.2$ m and the period of the motion is $T=0.25$ s. Determine:

- The angular (in rad/r and rpm) and linear velocities (1 POINT)
- The centripetal acceleration (0.5 POINTS)
- The mass of the body (0.5 POINTS)
- The frequency of motion (0.5 POINTS)

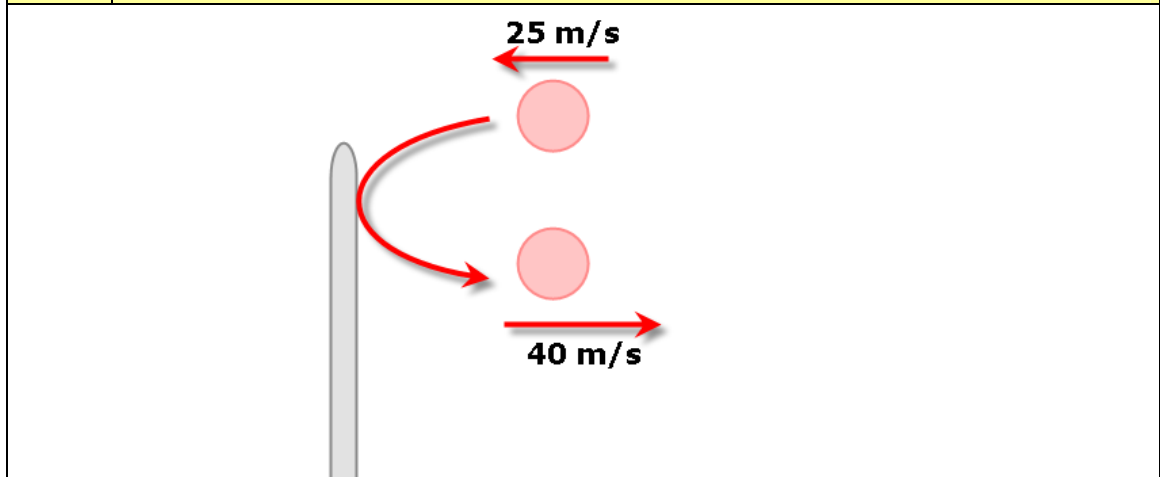
2.5 POINTS
ESTIMATED TIME: 10 min



3 A ball is hit and its direction changes, as indicated in the picture. The mass of the ball is 200 g and the time interval in which the ball and the bat are in contact is 0.025 seconds. Determine:

- The change in the linear momentum of the ball (1 POINT)
- The average force exerted on the ball by the bat (1.5 POINTS)

2.5 POINTS
ESTIMATED TIME: 10 min



4 Two bodies are tied and moving as shown in the picture. Determine:

- The normal and friction forces (1 POINT)
- The acceleration (1 POINT)
- The tension force (0.5 POINTS)

2.5 POINTS
ESTIMATED TIME: 15 min

