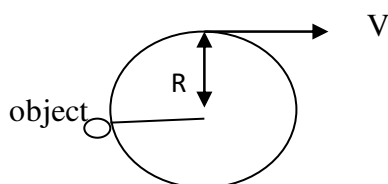


BA SANGAM COLLEGE
YEAR 12
PHYSICS
WORKSHEET 5

Refer to the information below to answer questions 1 to 2

An object is tied to a string and whirled around in a horizontal circle of radius R at a constant speed V , under the action of a centripetal force F .

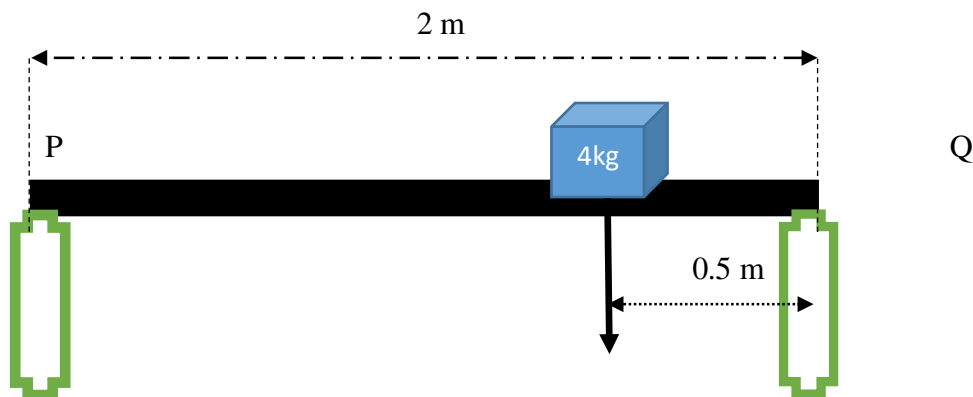


1. If the speed V , of the object and the radius R of the circle is doubled, the centripetal force acting on the object would be:
 - A. $4F$
 - B. $\frac{F}{2}$
 - C. F
 - D. $2F$

2. If the object whirls in a radius of 5cm and has a period of revolution of 0.5s. The centripetal acceleration of the object would be:
 - A. 0.6 ms^{-2}
 - B. 10 ms^{-2}
 - C. 12.6 ms^{-2}
 - D. 7.9 ms^{-2}

3. A 2kg stone whirls around on the end of a 0.5m string with a frequency of 2 revolutions per second.
 - i. What is its velocity?
 - ii. Calculate the tension in the string?
 - iii. With a reason state how much work is done by the centripetal force on the stone in one revolution.
 - iv. Calculate the acceleration of the 2kg stone.

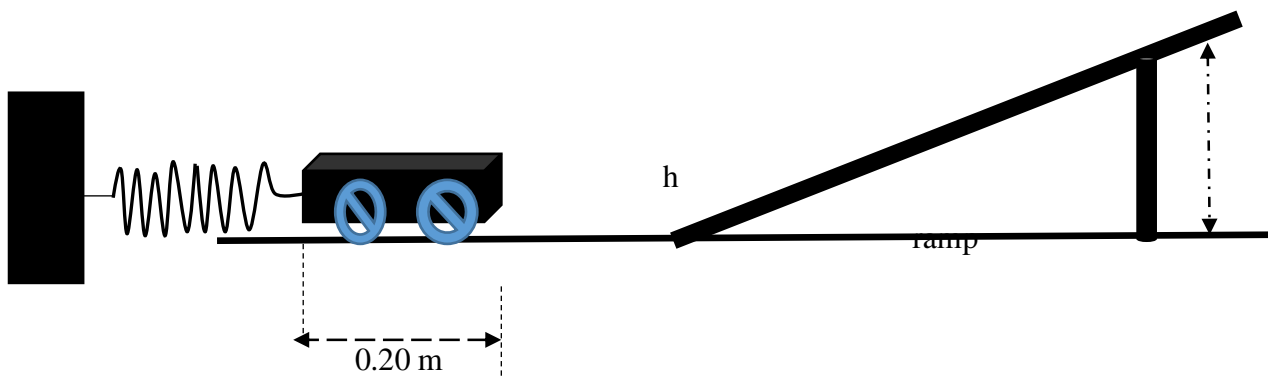
4. PQ represents a uniform beam of mass 2 kg supported at ends P and Q. A 4 kg object is placed so that it is 0.5 meters from Q. the beam is 2 m long.



Calculate:

- i. The reaction force at P?
- ii. How much does force on Q exceed the force on P?

5. A trolley of mass 1 kg is set up against a spring of spring constant 50 Nm^{-1} . The spring has been compressed 0.20 m. when the spring is released, the trolley runs up the ramp shown, friction can be neglected.



If there is no energy loss due to friction, calculate:

- i. The maximum speed of the trolley?
- ii. The vertical height, h, the trolley will rise up the ramp?
- iii. Define conservation of energy?