

## Unit 8 - Week 6

## Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

- Classical Mechanics: Orbits in Kepler Problem
- Classical Mechanics: Apsidal distances, eccentricity of orbits
- Classical Mechanics: Kepler's Third law; Laplace-Runge-Lenz vector
- Classical Mechanics: Rigid Body, degrees of freedom
- Quiz : Assignment 6
- Week 6 Feedback Form : Introduction to Classical Mechanics

Week 7

Week 8

Week 9

Week 10

Week 11

Week 12

Live session

Video Download

## Assignment 6

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2020-10-28, 23:59 IST.**

1) In an attractive  $1/r$  potential compare circular and parabolic orbits corresponding to same angular momentum. The perihelion distance of the parabola is  $\alpha$  times the radius of the circle. The  $\alpha$  is equal to **4 points**

- $1/\sqrt{2}$
- $1/2$
- 2

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $1/2$

2) A rock is fired vertically upwards from the surface of the Earth. It reaches a maximum distance  $\alpha R$  from the center. Here  $R$  is the radius of the Earth. Let  $v$  denote the speed with which the rock was fired. Now, imagine that the same rock is taken to a distance  $\beta R$  from the center of the Earth, and then fired with the same speed  $v$  as before. This time, however, the direction of  $v$  is not along the line joining the stone and the center of the Earth. The path of the stone will be *parabolic* if **6 points**

- $\frac{1}{\alpha} + \frac{1}{\beta} = 1$
- $\frac{1}{\alpha} + \frac{1}{\beta} > 1$
- $\frac{1}{\alpha} + \frac{1}{\beta} < 1$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $\frac{1}{\alpha} + \frac{1}{\beta} = 1$