

PHYS 1443 – Section 003

Lecture #6

Wednesday, Oct. 2, 2002

Dr. Jaehoon Yu

1. Newton's laws and its use in uniform and non-uniform circular motion
2. Motion in Accelerated Frames
3. Motion in Resistive Forces
4. Numerical Modeling in Particle Dynamics (Euler Method)

Today's homework is homework #7, due 12:30pm, next Wednesday!!

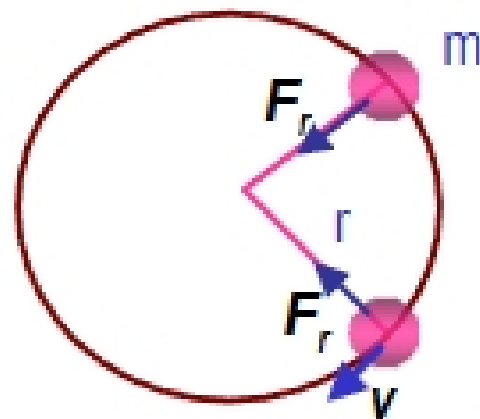


Announcements

- Due time for homework will be changed from 1am to 12pm on the due day, if everyone prefers this...
- Term Exam
 - Exam grading not complete yet. Will be done by next Monday
 - All scores are relative based on the curve
 - To take into account the varying difficulties of exams
 - This average will not be skewed by one or two outliers
 - Only two best of the three will be used for your final grading, after adjusting each exam scores to the overall average
 - Exam constitutes only 50% of the total
 - Do your homework well
 - Come to the class and do well with quizzes



Newton's Second Law & Uniform Circular Motion



The centripetal acceleration is always perpendicular to velocity vector, v , for uniform circular motion.

$$a_r = \frac{v^2}{r}$$

Are there forces in this motion? If so, what do they do?

The force that causes the centripetal acceleration acts toward the center of the circular path and causes a change in the direction of the velocity vector. This force is called **centripetal force**.

$$\sum F_r = ma_r = m \frac{v^2}{r}$$

What do you think will happen to the ball if the string that holds the ball breaks? Why?

Based on Newton's 1st law, since the external force no longer exist, the ball will continue its motion without change and will fly away following the tangential direction to the circle.