

PHYS 1443 – Section 001

Lecture #7

Thursday, June 8, 2006

Dr. **Jaehoon Yu**

- Kepler's Laws
- Motion in Accelerated Frames
- Work done by a constant force
- Scalar Product of Vectors
- Work done by a varying force
- Work and Kinetic Energy Theorem
- Potential Energy

Today's homework is HW #4, due 7pm, Monday, June 12!!

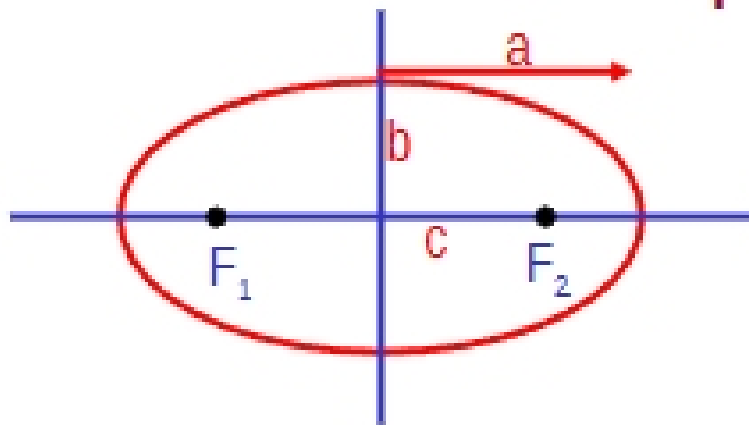


Announcements

- Mid-term exam
 - 8:00 – 10am, Thursday, June 15, in class
 - CH 1 – 8 or 9?



Kepler's Laws & Ellipse



Ellipses have two different axis, major (long) and minor (short) axis, and two focal points, F_1 & F_2

a is the length of a semi-major axis

b is the length of a semi-minor axis

Kepler lived in Germany and discovered the law's governing planets' movement some 70 years before Newton, by analyzing data.

1. All planets move in elliptical orbits with the Sun at one focal point.
2. The radius vector drawn from the Sun to a planet sweeps out equal area in equal time intervals. (**Angular momentum conservation**)
3. The square of the orbital period of any planet is proportional to the cube of the semi-major axis of the elliptical orbit.

Newton's laws explain the cause of the above laws. Kepler's third law is a direct consequence of law of gravitation being inverse square law.