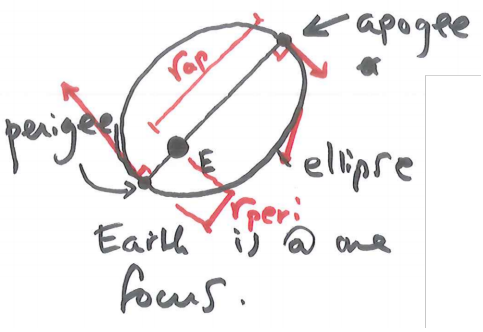
Name: _____ NetID: _____

# NYU Physics I—Term Exam 6

**Problem 1:** For the elliptical orbit shown, roughly what is the eccentricity? (From Lecture on 2016-11-17.)




**Problem 2:** In the twin paradox, which twin ages more? The one on the geodesic, or the one who changes reference frames? (From Lecture on 2016-12-06.)

**Problem 3:** What is the orbital period of something orbiting just outside the surface of the Earth, very roughly? (From Problem Set 11.)

**Problem 4:** What is escape velocity from the surface of the Earth? (From Problem Set 12.)

**Problem 5:** If the Earth were four times less massive than it is, but were still on a near-circular orbit at its current Earth–Sun distance, how much longer or shorter would the year be? (From the recitation on orbits.)

**Problem 6:** What is the spacetime interval between the two events $A$ and $B$?

$$A = (c\,t_A, x_A) = (1\,\mathrm{m}, 3\,\mathrm{m})$$

$$B = (c\,t_B, x_B) = (7\,\mathrm{m}, 6\,\mathrm{m})$$

Don't forget your units.