

ISP 205
Review Questions, Week 2

This is not required homework. It will not be graded. Answers will be supplied next week.

These questions are intended to help you think about the more important points from my lectures. The exams will ask you about these points, as well as about additional details. But note that the exams will be multiple choice questions.

1. Newton's second law says $F = m \times a$. If you triple the force you are applying to some object, how many times bigger will its acceleration be?

2. In a "close fly-by", a spacecraft is aimed so that it passes close to a planet, but does not actually hit it. Why can we use a close fly-by as a means to accelerate the spacecraft enough so that it can travel to the outer planets? (Think back to the encounter between the twins after they had aged a bit, or to the tennis ball – basket ball demo.)

3. In what way is the planet affected by this sort of close fly-by?

4. If you shoot a cannonball upwards from the surface of the Earth with more than the escape velocity, what will happen?
 - A. It will slow down and fall back to Earth.
 - B. It will move upwards at a steady velocity and just keep on going (i.e. it will *escape*).
 - C. It will slow down as it moves upwards, but it will keep on going.
 - D. It will speed up as it moves upwards, and will keep on going.

5. What do we mean by the statement "Energy is always conserved"?