

# Physics 130 General Relativity Seminar

## Assignment 1 January 20, 2011

### Part 1: Readings

**Cheng:** Chapter 1, 2

**Amanda Peet GR Lectures** - Appropriate pages.

**Other sources** among references on website or book in my office.

### Part 2: Review Questions from Text

You must do the readings BEFORE attempting the problems in order to get a good grasp of the overall content of the week's material to be understood. A problem should then make you look more carefully at specific parts of the readings that are necessary for the solution of that particular problem!

Suggested answers in textbook.

Will be discussed first in seminar.

Participation in discussion = 10% Seminar grade.

Any other questions about readings.

### Sage Advice from Amanda Peet

Participating in class. Sitting there like a vegetable while other students think hard and bother to answer questions is parasitic, intellectually. Contribute.

1. Review Questions Cheng: 1-2, 1-3, 1-6, 1-9
2. Review Questions Cheng: 2-3, 2-7, 2-11, 2-12

### Part 3: Everyone Problems

Everyone must understand these solutions.

Most solved in back of textbook.

Only look at solutions if completely stumped!

Will be discussed second in seminar.

Random choice of presenter.

Quality/correctness of presentation = 40% Seminar grade.

### More Sage Advice from Amanda Peet

Doing homework assignments by yourself. Copying off some "smart friend" cheats the other students in the class, and it cheats you and your friend. Identical-looking assignments will be referred to me by the grader. You may discuss general physics principles behind the questions with other students -and I encourage you to participate in study groups.

1. Cheng: 2-3, 2-5, 2-7, 2-8, 2-11
2. EP #12 Jumping Seagull
3. EP #20 Twins in Relativity
4. EP #23 Newtonian Gravity

### Part 4: Extra Problems

No solutions available before seminar.

Solve as many as you can.

Attempting zero is NOT an option!

Will be discussed third in seminar.

Volunteer presenter. Never volunteering is NOT an option!

Quality/correctness of presentation = 50% Seminar grade.

If a problem is not solved by anyone, then will be done in seminar.

1. EP #13 Lagrange Equations for Kepler Orbits
2. EP #14 Lagrange equations for Double Pendulum
3. EP #21 Multiple Lorentz Transformations
4. EP #24 Tides
5. EP #25 An Invisible Sphere
6. EP #26 Gravitational Fields

7. EP #88 Clocks and Rockets
8. EP #89 Events in Two Frames