

PHY 322: Intermediate Mechanics (Syracuse U., Spring 2006)

Computational assignment #1

1. Review “Computational Handout #1”.

An electronic version is available at <http://physics.syr.edu/~salgado/322/>.

In addition, the Maple worksheet (.mws) files and links to Maple tutorials can be obtained [here](#).

2. Choose ONE of the following assignments

- Redo one of the previous homework Problems (except for 1.5 and 2.20) using Maple in at least two significant ways (e.g., function plotting, equation solving, etc.).
- Using Maple, do this version of Problem 4.1:

A particle moves along the x -axis of frame I according to the equation

$$x(t) = 5t^2 + 2t + 4.$$

Find the position, velocity, and acceleration of the particle, as functions of t in the frame I'. Take I' to move with velocity $u = 2 \text{ m s}^{-1}$ along the x -axis of I.

- Define a position function x in frame I using the arrow-operator `->`.
- Obtain its associated velocity and acceleration functions using the `diff` operation.
- Graph each function using the `plot` function. Select convenient horizontal and vertical ranges.
- Define a transformed position function x_{new} in frame I' using the arrow-operator `->` in terms of your position function x in frame I and the “velocity u of frame I' ” according to frame I.
- Obtain its associated velocity and acceleration functions using the `diff` operation.
- Graph each function using the `plot` function. To facilitate comparisons, use the same ranges for the corresponding functions above.
- Describe (in words) the effect of the transformation for the position functions, for the velocity functions, and for the acceleration functions.

You are encouraged to seek help from me (Rob Salgado [see my contact information at the website above]) and from your classmates. However, please submit your own work.