

1. Read Marion (4th ed) Appendices A and C. Please also skim Appendices D through F to make yourself familiar with the information available there. Appx E in particular could be useful for this week's problems.

(These appendices cover the topics:

- A. Taylor's Thm
- C. Ordinary Diff Eqns
- D. Useful Formulas (some series and trig relations)
- E. Useful Integrals
- F. Differential Relations in Diff Coord Systems

If you're using a different edition and you can't find a corresponding appendix, let me know and I'll post these.)

True/False: I read this material.

2. Marion (4th ed) Ch 2, Problems 2, 3, 9, 12

For 2-9, show that the result in (b) reduces to that of (a) when the resistive force vanishes.

For 2-12, first find  $v(x)$  and use this to solve the problem (rather than use  $v(t)$ ).

3. A particle of mass  $m$  slides down an inclined plane. The motion is resisted by a force of magnitude  $cv^2$ . Show that the time required to move a distance  $d$  after starting from rest is

$$t = \frac{\cosh^{-1}(\exp(cd/m))}{\sqrt{(cg/m) \sin \theta}}$$

where  $\theta$  is the angle of inclination of the plane.