

Problem Set #4

Physics 302

Thursday, 15 February 2024

The following problems come from *Vibrations and Waves* (1971), by AP French.

- Problem 3-12 on page 72 \Rightarrow (10 points) You need to *prove* that the motion spirals into the origin for part (b). This problem concerns “phase space,” a topic we will revisit when we get to chaos.
- Problem 3-13 on page 72 \Rightarrow (10 points) This problem is an example of something you should have already done after reading the textbook and seeing me work through the damped oscillator in class.
- Problem 3-14 on page 72 \Rightarrow (10 points) After doing part (c), what can you say about the motion after 10 complete cycles?
- Problem 3-15 on pages 72-73 \Rightarrow (10 points) The large values of Q that you get in parts (a) and (b) are typical for piano strings.
- Problem 3-16 on page 73 \Rightarrow (20 points) Keep in mind that $Q \gg 1$ for a radiating electron. Watch for “factor of 2” goofs in the back-of-the-book answers.

Due date: **Tuesday, 27 February 2024** (*beginning of class*)