

Phys 410 – Homework #3

All numbered problems from Taylor.

- 1) (a) (3 pts) The Green's function for a linear oscillator that starts from rest is given in the lecture notes. Use Green's method to calculate $x(t)$ for such an oscillator for the case where it is undamped, has natural frequency ω_0 , and is driven by an impulse force function. The force function has the following form: it is zero before $t = 0$, is constant with value F_0 for $0 < t < \tau$, where $\tau = 2\pi/\omega_0$, and is zero again for $t > \tau$. Make a plot or sketch of the resulting motion of the oscillator. (b) (3 pts) Give an intuitive physical explanation for why the oscillator behaves the way it does for time $t > \tau$.
- 2) 5.13 (3 pts)
- 3) 5.24 (3 pts)
- 4) 5.26 (3 pts)
- 5) 5.41 (3 pts)
- 6) 5.49 (3 pts)
- 7) 5.53 (a and b) (6 pts)
- 8) 7.15 (3 pts)
- 9) 7.21 (3 pts)
- 10) 7.29 (3 pts)