

# Physics 106a – Problem Set 6 – Due Nov 18, 2004

Version 2

November 29, 2004

These problems cover the material on simple harmonic oscillators in Hand and Finch Chapter 3 and Section 3.1 of the lecture notes. Please again write down the rough amount of time you are spending on each problem.

**Changes since v. 1:** Added note on sign error for Hand and Finch 3.19.

1. Hand and Finch 3.2. You may use the formulae in Section 3.1 of H&F; you don't need to Taylor expand everything from scratch.
2. Hand and Finch 3.4
3. Hand and Finch 3.16
4. Hand and Finch 3.18
5. Hand and Finch 3.19. By “prove using superposition”, H&F simply mean that you should use the fact that the driven simple harmonic oscillator equation is linear and therefore if one has solutions  $q_1(t)$  and  $q_2(t)$  for separate driving forces  $F_1(t)$  and  $F_2(t)$ , then the solution when the driving force is  $F_1(t) + F_2(t)$  is  $q_1(t) + q_2(t)$ . **Note: there is almost certainly a sign error in Equation 3.103 of Hand and Finch. Do not expect to match their sign.**