

Physics A300: Classical Mechanics I

Problem Set 5

Assigned 2004 October 19

Due 2004 October 26

Show your work on all problems!

1 Superposition of Forces in the Harmonic Oscillator

Do Symon chapter two, problem 57

2 Vector Practice

When doing the following problems from Symon, be sure to put an arrow over each vector (except for unit vectors, which get a hat). Symon uses boldface, but that's easy to lose track of, so for this course we'll insist on the arrow notation. So for example, Symon writes his equation (3.10) as

$$\mathbf{A} = A_x \hat{\mathbf{x}} + A_y \hat{\mathbf{y}} + A_z \hat{\mathbf{z}}$$

while we will write

$$\vec{A} = A_x \hat{x} + A_y \hat{y} + A_z \hat{z}$$

2.1 Explicit Calculation

Consider the vectors

$$\vec{A} = \hat{x} + 2\hat{y} - \hat{z} \quad \vec{B} = -2\hat{x} + 3\hat{y} + \hat{z}$$

Calculate:

- $\vec{A} - \vec{B}$ and its magnitude $|\vec{A} - \vec{B}|$
- $\vec{B} \cdot \vec{A}$
- The angle between \vec{A} and \vec{B}
- $\vec{A} \times \vec{B}$
- $(\vec{A} - \vec{B}) \times (\vec{A} + \vec{B})$

2.2 Symon Chapter Three Problem 2

2.3 Symon Chapter Three Problem 5