

PROBLEM SET #4
Due Friday 9th October 9am

READING: Young and Freedman Chapter 3 §5; Chapter 4 §§5-6.

FORMAT: Please read the instructions on the web page concerning the required format for problem sets.

- 4-1) Young and Freedman, exercise 4.28, page 133.
- 4-2) Young and Freedman, exercise 4.32, page 133.
- 4-3) Young and Freedman, exercise 4.43, page 134. Please use m_A and m_B instead of 6 kg and 4 kg.
- 4-4) Young and Freedman, exercise 4.57, page 135.
- 4-5) Young and Freedman, exercise 4.39, page 134.
- 4-6) An object with zero velocity at time $t = 0$ accelerates Eastward with acceleration 3α and Northward with acceleration 4α , where α is a constant. At time $t = T$ the object stops accelerating Eastward. Thereafter it accelerates Westward with acceleration 3α , with its Northward acceleration continuing unchanged. *It you choose to use angles, the following might prove useful: $\cos^{-1} \frac{4}{5} = \sin^{-1} \frac{3}{5} = \tan^{-1} \frac{3}{4} \approx 37^\circ$.*
- a) What is the velocity at time $t = T$?
- b) What is the average acceleration between times $t = 0$ and $t = T$?
- c) What is the position at time $t = T$?
- d) What is the velocity at time $t = 2T$?
- e) What is the average acceleration between times $t = 0$ and $t = 2T$?
- f) What is the position at time $t = 2T$?