

Review Sheet for Phys. 115 - Exam I

Chapter 1

- 1) What are the base SI units?
- 2) The three sides of a right triangle are H (hypotenuse), O (opposite) and A (adjacent). Angle θ is the angle between H and A. What are $\sin \theta$, $\cos \theta$, and $\tan \theta$?
- 3) How do you break vectors into x and y components?
- 4) How do you add vectors?
- 5) How do you find the direction of a vector knowing its components?

Chapter 2

- 1) What is displacement? Is it a scalar or a vector? What are its units?
- 2) What is speed? What is velocity? What is the relationship between displacement and velocity? What are their units?
- 3) What is the relationship between acceleration and velocity? What are the units of acceleration? Can a be zero and v non-zero? Can v be zero and a non-zero?
- 4) What are the kinematic equations for constant acceleration?
- 5) What are the kinematic equations for free fall?
- 6) What acceleration acts on a free-falling body? What is its direction during ascent? What is its direction during descent?
- 7) What is the direction of velocity during ascent? During descent? At the top of the trajectory?

Chapter 3

- 1) What are the kinematic equations for constant acceleration in the x and y direction?
- 2) What are the kinematic equations for constant acceleration in the x direction of projectile motion?
- 3) What are the kinematic equations for constant acceleration in the y direction of projectile motion?
- 4) What is the velocity at the top of the trajectory in projectile motion?
- 5) What is the acceleration at the top of the trajectory in projectile motion?

Chapter 4

- 1) What is Newton's first law?
- 2) What is Newton's second law?
- 3) What is Newton's third law?
- 4) What is force? what are its units? Is it a scalar or a vector?
- 5) What is the universal law of gravitation? (Why "universal?")
- 6) What is the weight of an object? Does it have the same value anywhere in the universe?
- 7) What is a normal force? What is its direction?
- 8) What is apparent weight?
- 9) What are static and kinetic friction? What is the difference between them?
- 10) What is the tension force? In what direction does it act?
- 11) What conditions do objects in equilibrium have to obey?

Chapter 5

- 1) What is the period of rotation T ?
- 2) How can we relate the period of rotation with the radius of the circle and the speed of the rotating object?
- 3) What is the magnitude and direction of the centripetal acceleration?
- 4) What is the centripetal force? How do we include it in problems? Which side of the equation $\Sigma F = ma$ does it go on?
- 5) Which forces do we take as positive and which as negative?