

SPH4U Unit 1 Dynamics Part One

Expectations for SPH4U

- *Express the results of any calculations accurately and precisely, with the appropriate number of decimal places or significant digits.
- *Be able to rearrange equations into the appropriate form and solve for an unknown quantity.
- *Be able to convert units (eg. cm to m).
- *Use appropriate units and symbols for equations, vector diagrams and vector components.
- *Be able to use math concepts such as angle properties, SOH CAH TOA, Pythagorean theorem, cosine and sine laws, and the quadratic formula.

Expectations for Unit One Dynamics Part One

- *Solve problems related to motion and projectile motion

To enhance your understanding, be sure to complete all readings.

Problems must be solved using proper form (given, required, solution, showing the equation, carrying units) and notation, with the aid of a diagram where appropriate (ex. vector sketch, FBD etc).

Answers must be stated with a unit and the correct number of sig digs and direction where appropriate.

Website: www.point59.ca/physics.htm

CONCEPTS	Homework
<p>1) <i>Sig digs, Certainty, Precision and Complex Equation Rules, Round to Even</i> Be able to identify the number of sig digs in a number Be able to calculate using the certainty rule, precision rule and complex equation rule. Explain and use the round to even rule. Solve problems related to speed.</p>	<p>Read: website help pages as needed Worksheet</p>
<p>2) <i>Motion</i> Understand and be able to state units for distance, displacement, speed, velocity and acceleration. Explain negative acceleration. Find final velocity from the average velocity equation. Find acceleration using final velocity when initial velocity is 0.</p>	<p>Read pg 8, 9, 14 Pg 10; 1-5a Pg 16; 2-5, 7 Extra questions: 1) A remote car travels 25 m [F] in 6.3 s. Find its final velocity. <i>Ans. 7.9 m/s</i> 2) A car slows down over 0.25 km in 8.7 s. Find its initial and final velocity. <i>Ans. 57 m/s [F], 0 m/s</i></p>
<p>3) <i>Motion Equations and Acceleration Due to Gravity</i> Be able to choose and <u>rearrange</u> the motion equations. Solve problems using the motion equations. Solve problems related to acceleration due to gravity. Solve problems involving the quadratic formula.</p>	<p>Read pg 18 (top), 20 (top) Pg 20; 1, 3, 5 Pg 21; 5, 6, 7</p>
<p>4) <i>Adding Vectors</i> Be familiar with the four methods for adding vectors. Break any vector into its components. Find a vector given its components. Add two or more vectors using vector components.</p>	<p>Read pg 25 (bottom), 26 (top), 703 Pg 26; 1 Pg 29; 4, 5, 6, 9 Pg 28; 2, 3</p>
<p>5) <i>Projectile motion</i> Determine the x and y components of an initial velocity vector. Solve projectile motion problems for objects landing at a different height from projection height. Find the final velocity for a projectile.</p>	<p>Read pg 36, 37 Pg 40; 3, 4 Pg 43; 2, 3, 4, 5, 7 <i>Ans. for 7: lands on building, range is 170 m [forward]</i></p>

CONCEPTS	Homework
<p>6) <i>Relative Velocity At Right Angles</i> Explain frames of reference and velocity in two dimensions. Solve problems related to relative velocity at right angles.</p>	<p>Read pg 44 Pg 47; 1 Pg 48; 5, 7 Pg 49; 1, 4 Questions below</p>
<p>Extra questions for Relative Velocity at Right Angles: 1) A 70. m wide river flows at 0.80 m/s. A girl swims across it at 1.4 m/s relative to the water. (a) What is the least time she requires to cross? (b) How far downstream will she be? (c) At what angle would she have to aim, in order to arrive at a point directly opposite the starting point? (d) How long would the trip in part (c) take? 2) A newspaper delivery person rides along the sidewalk and throws the newspapers onto the porches of the houses. The sidewalk is 15 m in front of the porches. The person can throw at the horizontal speed of 6.0 m/s relative to themselves and rides the bicycle at a speed of 4.0 m/s relative to the sidewalk. (a) With what velocity do the newspapers actually travel relative to the ground? (b) How far in advance of a porch should the person throw a newspaper so that it lands on the porch?</p>	
<p>7) <i>Relative Velocity Using the Cosine Law</i> Define air speed (air velocity), ground speed (ground velocity) and headings. Solve relative velocity problems using the cosine and sine laws.</p>	<p>No reading! Pg 48; 2, 3, 6, 9 Pg 49; 2, 3, 5, 6</p>
<p>TEST Dynamics Part One</p> <p>Make sure you review your notes thoroughly. Complete all of the readings. Complete all assigned homework questions.</p> <p>Extra questions:</p> <p>Multiple Choice Practice: Pg 54; 2-4, 6</p> <p>Problems: Pg 55; 15-17, 19, 22, 31, 34, 38, 41-43, 45, 48, 57, 60, 68, 70, 71, 74, 75, 77, 79</p>	