

SECTIONS A & B 01-05-07 SEMI-ANNOUNCED QUIZ (but alas! Closed Book – Closed Notes)

For the following question - show all work as applicable of our standard “*Problem Solving Protocol*”, including – but not necessarily limited to – sketching the scenario, listing pertinent relationships, accounting for appropriate units throughout, rearranging relationships as necessary to solve for requested unknown(s), etc.. If you need extra sheets for this purpose please be certain that all such sheets have your name on them and are firmly attached to this page. (NOTE: *The more complete & accurate detail provided – the better.*)

Mr. Menin’s dog “Bing-Bing” & cat “Chi-Chi” are home alone one evening in the limited reaches of the Menin household. Though Bing-Bing might ardently think she is un-attracted to Chi-Chi – his tuxedo coat notwithstanding - Newton’s Universal Law of Gravitation would indicate otherwise. At one point during the evening Chi-Chi approaches Bing-Bing until there’s only a meter of distance separating them. At that time Bing-Bing becomes immediately rather apprehensive and decides to move away from Chi-Chi such that the distance separating them quadruples. Now, ignoring the inherent gravitational attraction of all other objects in the room or elsewhere – calculate the effect of the increased (*quadrupled*) distance on the attractive force between Bing-Bing and Chi-Chi relative to what it was when they were only one meter apart, *i.e. does the force go up or down and by how much or by what factor?*

SECTIONS D&E 01-05-07 SEMI-ANNOUNCED QUIZ (but alas! Closed Book – Closed Notes)

For the following question - show all work as applicable of our standard “*Problem Solving Protocol*”, including – but not necessarily limited to – sketching the scenario, listing pertinent relationships, accounting for appropriate units throughout, rearranging relationships as necessary to solve for requested unknown(s), etc.. If you need extra sheets for this purpose please be certain that all such sheets have your name on them and are firmly attached to this page. (NOTE: *The more complete & accurate detail provided – the better.*)

A Federal Express airplane is traveling at a velocity of 600.00 mph (30° N of E) at an altitude of 1,000.00 meters when it accidentally releases a 50 pound piece of frozen lavatory discharge – *not a pretty popsicle !!* At the instant of release the plane is directly above A-B High School. Estimate, via your knowledge of the principles and equations of kinematics, the distance (aka “range”) from the school that the piece lands. (*You may assume that that the ground around the school is level within the range that the piece will land.*) Though a cross-wind at the time of release is 50 Km/hr, all air resistance affects may be ignored as you work towards the problem solution.