

1014-W1-1370 **Michael Livshits*** (michaelliv@gmail.com), 36 Linnaean Street, Apt. #14, Cambridge, MA 02138. *A Rocket, a Holy Bucket and a Parabola.*

Problem 1: There is a bucket with a small hole in it, filled with water to the given level above the hole. How long will it take for all the water above the hole to leak out? Neglect the viscosity of water.

Problem 2: The lunar landing module is $1/3$ the propellant by weight. The velocity of the propellant is 1500 m/sec. How much time can the module hang over the lunar surface if the free fall acceleration near Moon is $1/6$ of the one near Earth?

Problem 3: The point (a, b) is inside the parabola $y = x^2$, i.e., $b > a^2$. How many perpendiculars can one drop on the parabola from this point? Show that the abscissas of the feet of these perpendiculars sum up to zero. (Received September 28, 2005)