2014-15 University of Utah Undergraduate Problem Solving Contest

Problem 5

Due March 9, 2015

Your tricky Calculus professor has drawn a curve above the parabola $y = x^2$ and between the points $P = (-1.5, 2.25)$ and $Q = (3, 9)$. However, being tricky, she claims she has forgotten the formula of the curve. Your task is to find a point R on the parabola $y = x^2$ and between P and Q so that the area bounded by her curve and the straight segments PR and QR is as large as possible. She assures you that the segments won't intersect her curve, no matter what point you choose for R.

In the spirit of UPSC, you should not use the internet or look up the solution in a book. Please include your **name, student ID number, and email address** on your solution. Grading will proceed more quickly if your final answer is written clearly at the beginning of the first page of your solution, followed by your work and justification.