

2014-15 University of Utah Undergraduate
Problem Solving Contest

Problem 6

Due April 7, 2015

Find all polynomials p of degree 3 or less such that for any polynomials q of degree 3 or less, the coefficient of x^3 in the product $p \cdot q$ is equal to $q(\frac{1}{2})$. Demonstrate that you have found all the required polynomials.

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.