

Undergraduate Problem Solving Contest

Problem 2

Due October 25th, 2013

$$p(x) = x^{2011} + x^{1783} - 3x^{1707} + 2x^{341} + 3x^2 - 2$$

Find the remainder (without using a calculator) when you divide $p(x)$ by $x^3 - x$. Express your answer as the function $r(x)$ in terms of x . Show ALL steps for your solution.

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.