Math 113 – Homework 5

Due: 29 November 2005 Tuesday.

Q-1) For any positive integer n define the polynomial $p_n(x) = (x-1)(x-2)\cdots(x-n)$. Find a formula for $\int \dfrac{1}{p_n(x)}\,dx$, and prove your formula.

Q-2) Evaluate $\displaystyle\int \frac{x^3 + x^2 + x + 1}{x^5 - 11\,x^4 + 47\,x^3 - 97\,x^2 + 96\,x - 36}\,dx$.

Q-3) Evaluate $\displaystyle\int \frac{22x^2 + 60x + 63}{(x-3)(x^2 + 3x + 3)^2}\,dx$.

Q-4) Find $\displaystyle\int \frac{1}{\sqrt{3}\sin x - \cos x}\,dx$.

Q-5) Find $\displaystyle\int \frac{x}{\sqrt{x^2 + 2x + 2}}\,dx$.

Show in reasonable detail how you solve these problems.

Comments and questions to sertoz@bilkent.edu.tr