MATH 141 HW April 12 Spring 2010 (keep it for your records)

Problem 1. Write out the form of the partial fraction decomposition. (Do not find the numerical values of the coefficients.)

(a) $\dfrac{3x-1}{(x-3)(x+4)}$

(b) $\dfrac{2x-3}{x^3-x^2}$

(c) $\dfrac{5}{x(x^2-4)}$

(d) $\dfrac{x^2}{(x+2)^3}$

Problem 2. Evaluate the integral.

(a) $\displaystyle\int \frac{dx}{x^2-3x-4}$

(b) $\displaystyle\int \frac{dx}{x^2-6x-7}$

(c) $\displaystyle\int \frac{11x+17}{2x^2+7x-4}\,dx$

(d) $\displaystyle\int \frac{dx}{x(x^2-1)}$

(e) $\displaystyle\int \frac{x^2-8}{x+3}\,dx$

(f) $\displaystyle\int \frac{x^2+1}{x-1}\,dx$

(g) $\displaystyle\int \frac{3x^2-10}{x^2-4x+4}\,dx$

(h) $\displaystyle\int \frac{x^2}{x^2-3x+2}\,dx$

Problem 3. Evaluate the integral by making a substitution that converts the integrand to a rational function.

(a) $\displaystyle\int \frac{\cos\theta}{\sin^2\theta+4\sin\theta-5}\,d\theta$

(b) $\displaystyle\int \frac{e^t}{e^{2t}-4}\,dt$