

Sample Final Exam

Problem 1. Compute

$$\int \frac{\sqrt{1+x^2}}{x} dx$$

Problem 2. Compute the integral

$$\int \arctan 4t dt$$

(Hint: Use integration by parts).

Problem 3. Compute

$$\int \frac{dx}{(5-4x-x^2)^{5/2}}$$

Problem 4. Find the inverse of

$$y = \frac{4x-1}{2x+3}$$

Problem 5. Use Partial Fractions to compute

$$\int \frac{1}{(x+5)^2(x-1)} dx$$

Problem 6.

(a) Determine whether or not the following integral is convergent

$$\int_1^{\infty} \frac{x}{(1+x^2)^{3/2}} dx$$

(b) Determine whether or not the following integral is convergent

$$\int_{-\infty}^{\infty} e^{-|x|} dx$$

If it is, compute its value.