Calculus III

Exam #1

1) (60 points) Compute the following integrals.

a) $\int \sin^{-1} 2x \, dx$

b) $\int \frac{(1-x^2)^{5/2}}{x^6} \, dx$

c) $\int \frac{4x^3 - x^2 + 16x}{x^2 + 4} \, dx$

d) $\int p^4 e^{-p} \, dp$

e) $\int \frac{2\sqrt{x} \, dx}{x + 4x^2}$

2) (40 points) Determine whether the following integrals converge or diverge.

a) $\int_{-1}^{5} \frac{dx}{(x-1)^3}$

b) $\int_0^\infty \frac{dx}{\sqrt{x}(x+1)}$

c) $\int_2^\infty \frac{dx}{x^2 - 3}$