H.W. 3

Due Monday Jan. 26th

Tuesday: u-substitution with limits of integration

Use u-substitution as given in the problem to transform the definite integral shown. Then use the limits of integration determined by u to evaluate the integral.

(i)

$$\int_0^2 xe^{x^2}\,dx$$

$$u = x^2$$

(ii)

$$\int_{-2}^{-1} 2xcos(x^2)sin^2(x^2)\,dx$$

$$u = sin(x^2)$$

Wednesday and Friday: Integration by Parts (Reverse Product Rule)

Use integration by parts (possibly multiple times) and/or u-substitution, where appropriate, to evaluate the following integrals:

You need only do one of (v), (vi) and (vii)

(i)

$$\int_0^{-1} x^2 cos(x^3)\, dx$$

(ii)

$$\int_0^{\pi/4} cos(3x) sin(4x)\, dx$$

(iii)

$$\int_0^2 (6x^2 + 2x)(2x^3 + x^2)^{-3/4}\, dx$$

(iv)

$$\int_0^{\pi/4} cos(x)sin(x)\, dx$$

*(v)

$$\int_0^1 x^7 e^{x^4}\, dx$$

*(vi)

$$\int_{\sqrt{\frac{\pi}{2}}}^{\sqrt{\pi}} \frac{1}{x^5} sin(\frac{1}{x^2})\, dx$$

*(vii)

$$\int_0^{ln(\pi/4)} e^{3x} sin(e^x)\,dx$$