## 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)

$$\int_0^2 x e^{x^2} dx$$
$$u = x^2$$

(ii)

 $\int_{-2}^{-1} 2x\cos(x^2)\sin^2(x^2) dx$  $u = \sin(x^2)$ 

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

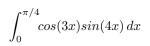
Use integration by parts (possibly multiple times) and/or u-substitution, where appropriate, to evaluate the following integrals:

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

(i)

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

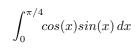
(ii)



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

(iv)

(iii)



\*(v)

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

\*(vi)

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

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

\*(vii)