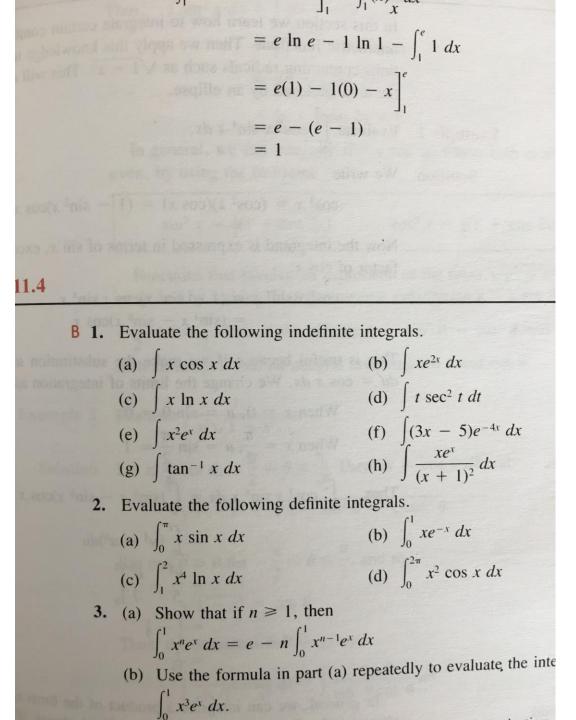# Credit Student Assignment#4
# Integration By Parts

Assignment#4 Integration By Parts          (Due May15/20)


Question#1(a-g)  replace (e) with $\int x^2\cos 2x \, dx$
Question#2(a,b)

Answers are provided so once again it is about the process.

$$= e \ln e - 1 \ln 1 - \int_1^e 1 \, dx$$

$$= e(1) - 1(0) - x \Big]_1^e$$

$$= e - (e - 1)$$

$$= 1$$

## 11.4

**B 1.** Evaluate the following indefinite integrals.

(a) $\displaystyle\int x \cos x \, dx$

(b) $\displaystyle\int xe^{2x} \, dx$

(c) $\displaystyle\int x \ln x \, dx$

(d) $\displaystyle\int t \sec^2 t \, dt$

(e) $\displaystyle\int x^2 e^x \, dx$

(f) $\displaystyle\int (3x - 5)e^{-4x} \, dx$

(g) $\displaystyle\int \tan^{-1} x \, dx$

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

**2.** Evaluate the following definite integrals.

(a) $\displaystyle\int_0^\pi x \sin x \, dx$

(b) $\displaystyle\int_0^1 xe^{-x} \, dx$

(c) $\displaystyle\int_1^2 x^4 \ln x \, dx$

(d) $\displaystyle\int_0^{2\pi} x^2 \cos x \, dx$

**3.** (a) Show that if $n \geq 1$, then

$$\int_0^1 x^n e^x \, dx = e - n \int_0^1 x^{n-1} e^x \, dx$$

(b) Use the formula in part (a) repeatedly to evaluate the inte

$$\int_0^1 x^3 e^x \, dx.$$

6. $\frac{1}{6}(41\sqrt{41} - 1)$      7. 2      8. $\frac{1}{2}(e^2 - 3) + \dfrac{1}{e}$

9. (a) $2 \ln (\sqrt{x} + 1) + C$
   (b) $x + 2 - \ln|x + 2| + C$

## EXERCISE 11.4

1. (a) $x \sin x + \cos x + C$   (b) $\frac{1}{2}xe^{2x} - \frac{1}{4}e^{2x} + C$

   (c) $\frac{1}{2}x^2 \ln x - \frac{1}{4}x^2 + C$

   (d) $t \tan t - \ln|\sec t| + C$

   (e) $(x^2 - 2x + 2)e^x + C$

   (f) $\left(\frac{17}{16} - \frac{3}{4}x\right)e^{-4x} + C$

   (g) $x \tan^{-1} x - \frac{1}{2} \ln(x^2 + 1) + C$

   (h) $\dfrac{e^x}{x + 1} + C$

2. (a) $\pi$   (b) $1 - \dfrac{2}{e}$   (c) $\frac{32}{5} \ln 2 - \frac{31}{25}$   (d) $4\pi$

3. (b) $6 - 2e$      4. $2e^{\sqrt{x}}(\sqrt{x} - 1) + C$

5. $\frac{1}{9}(1 - 7e^{-6})$      6. $5 \ln 5 - 4$

7. $\frac{1}{2}e^x(\sin x - \cos x) + C$