

Calculus 2	Quiz 3	
		NAME
10 points	2 pages	Ciara Swann

DIRECTIONS: Show all the work in the space provided. Box the final answers, and follow the indicated directions.

Calculate the following integrals:

1. $\int x^2 e^{2x} dx$ $\int uv dx = u \int v dx - \int (u' \int v) dx$

$$x^2 \int e^{2x} - \int \left(\frac{d}{dx} (x^2) \int e^{2x} \right) dx =$$

$$\frac{1}{2} x^2 e^{2x} - \int \left(2x \times \frac{1}{2} e^{2x} \right) dx =$$

$$\frac{1}{2} x^2 e^{2x} - \int x e^{2x} dx$$

$$\frac{1}{2} x^2 e^{2x} - x \int e^{2x} + \int \left(\frac{d}{dx} (x) \int e^{2x} \right) dx =$$

$$\frac{1}{2} x^2 e^{2x} - \frac{1}{2} x e^{2x} + \frac{1}{2} \int e^{2x} dx =$$

$$\frac{1}{2} x^2 e^{2x} - \frac{1}{2} x e^{2x} + \frac{1}{4} e^{2x} + C =$$

$$\boxed{\frac{1}{2} e^{2x} \left(x^2 - x + \frac{1}{2} \right) + C}$$

$$2. \int (\ln x)^2 dx \quad \int u dv = uv - \int v du$$

$$x \ln^2(x) - \int \frac{2x \ln(x)}{x} dx =$$

$$x \ln^2(x) - 2 \int \ln(x) dx$$

$$\int \ln(x) dx = x \ln(x) - \int \frac{x}{x} dx =$$

$$x \ln(x) - \int dx =$$

$$x \ln(x) - x + C \rightarrow$$

$$x \ln^2(x) - 2(x \ln(x) - x) + C =$$

$$\boxed{x \ln^2(x) - 2x \ln(x) + 2x + C}$$