

# Math 142 Quiz II Form A NAME & SECTION: Damian Sclafani

Directions: In order to receive full or partial credit, show all work below. Use the back of this page if you need more room to justify your answer.

Problem 1. (12 pts) Find the following integrals. Show enough work to justify your answer.

(a)

$\int$

$$e^{2x} \sin(x) \, dx$$

$$U = \sin(x)$$

$$Du = \cos(x) \, dx$$

$$Dv = e^{2x}$$

$$V = 1/2 e^{2x}$$

$$1/2 e^{2x} \sin(x) - 1/2 \int e^{2x} \cos(x) \, dx$$

$$U = \cos(x)$$

$$Du = -\sin(x) \, dx$$

$$Dv = e^{2x} \, dx$$

$$V = 1/2 e^{2x}$$

$$1/2 e^{2x} \sin(x) - [1/2 e^{2x} \cos(x) + 1/2 \int e^{2x} \sin(x) \, dx]$$

Repeats

$$1/4 e^{2x} \sin(x) + 1/4 e^{2x} \cos(x)$$

(b)

$\int$

$$\sin^2(2x) \cos^3(2x) \, dx$$

$$U = \sin(2x)$$

$$Du = \cos(2x) \, dx$$

$$1/2 \int$$

$$\sin^2(2x) \cos^2(2x) \, du$$

$$1/2 \int \sin^2(2x) [1 - \sin^2(2x)] \, du$$

$$1/2 \int u^2 [1 - u^2] \, du$$

$$1/2 \int u^2 - u^4 \, du$$

$$1/2 (1/3 u^3 - 1/5 u^5)$$

$$1/2 (1/3 \sin^3(2x) - 1/5 \sin^5(2x))$$