

Name: SOLUTIONS

Quiz #3 - February 3, 2009

1. Compute  $\int x e^{3x} dx$ .

$$u = x \quad v = \frac{1}{3} e^{3x}$$
$$du = dx \quad dv = e^{3x}$$

$$= \frac{1}{3} x e^{3x} - \int \frac{1}{3} e^{3x} dx = \boxed{\frac{1}{3} x e^{3x} - \frac{1}{9} e^{3x} + C}$$

2. Compute  $\int \sec^4 x \tan x dx$ .

$$u = \sec x \quad du = \sec x \tan x dx$$
$$\rightarrow \int u^3 du = \frac{1}{4} u^4 + C = \boxed{\frac{1}{4} \sec^4 x + C}$$

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Quiz #3 - February 3, 2009

1. Compute  $\int x e^{3x} dx$ .

2. Compute  $\int \sec^4 x \tan x dx$ .

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Quiz #3 - February 5, 2009

1. Compute  $\int x^2 \sin x \, dx$ .  $u = x^2 \quad du = 2x \, dx$   
 $dv = \sin x \, dx \quad v = -\cos x$

$= -x^2 \cos x + \int 2x \cos x \, dx$   
 $u = 2x \quad dv = \cos x \, dx$   
 $du = 2 \, dx \quad v = \sin x$

$= -x^2 \cos x + 2x \sin x - \int 2 \sin x \, dx$   
 $= -x^2 \cos x + 2x \sin x + 2 \cos x + C$

2. Compute  $\int \sin^3 x \cos^2 x \, dx$ .  $= \int (1 - \cos^2 x) \cos^2 x \sin x \, dx$   $u = \cos x \quad du = -\sin x$

$= \int -(1 - u^2) u^2 \, du$   
 $= \int u^2 - u^4 \, du = \frac{1}{3} \cos^3 x - \frac{1}{5} \cos^5 x + C$

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Quiz #3 - February 5, 2009

1. Compute  $\int x^2 \sin x \, dx$ .

2. Compute  $\int \sin^3 x \cos^2 x \, dx$ .