

Name:

Class quiz 5

February 23, 2018

Evaluate the following integrals.

(a) $\int 2x \cos(2x) dx$

$$u = x \quad u' = 1$$
$$v' = 2 \cos(2x) \quad v = \sin(2x)$$

$$= x \sin(2x) - \int \sin(2x) dx$$

$$= x \sin(2x) + \frac{\cos(2x)}{2} + C$$

(b) $\int \cos^3(x) \sin^2(2x) dx = \int \cos^3(x) (4 \cos^2 x \sin^2 x) dx$

$$= 4 \int \cos^5 x \sin^2 x dx$$

$$u = \sin x$$
$$du = \cos x dx$$

$$= 4 \int (1-u^2)^2 u^2 du$$

$$= 4 \int u^2 - 2u^4 + u^6 du = 4 \left(\frac{u^3}{3} - \frac{2u^5}{5} + \frac{u^7}{7} \right) + C$$

$$= 4 \left(\frac{\sin^3 x}{3} - \frac{2 \sin^5 x}{5} + \frac{\sin^7 x}{7} \right) + C$$