

PRINT Your Name: _____

Quiz 8 — September 22, 2015

Remove everything from your desk except this page and a pencil or pen.

The solution will be posted soon after the quiz is given.

Circle your answer. **Show your work.** Your work must be correct and coherent. **Check your answer.**

Find $\int \frac{x dx}{e^{3x}}$. **Please check your answer.**

Use integration by parts. Let $u = x$ and $dv = e^{-3x} dx$. Compute $du = dx$ and $v = \frac{-1}{3}e^{-3x}$. It follows that

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

Check. The derivative of the proposed answer is

$$(-3)\frac{-x}{3}e^{-3x} + \frac{-1}{3}e^{-3x} + \frac{1}{3}e^{-3x} = xe^{-3x}. \checkmark$$