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LT1: I can evaluate integrals using substitution and integration by parts and explain which technique is appropriate and why.

1. Which technique would you use to solve the following integral: substitution or integration by parts?

$$\int x^2 e^{x^3} dx$$

(a) Explain your choice using concise, complete sentences.

The Integral holds a composite function. Specifically x^3 within e^x that can be evaulated. We could see that If we take the derivative of x^3 then It could cancel out with the x^2 on the outside.

(b) Evaluate the integral. Neatly write out your solution process, providing clear steps and using words as necessary to connect each step.

$\int x^2 e^{x^3} dx$ — We set our u as x^3

$$u = x^3 \qquad dx = \frac{1}{3x^2}$$
$$du = 3x^2 dx$$

We find our du by taking the derivative & dx by solving for it.

$\int x^2 e^u \cdot \frac{1}{3x^2}$ — Cancel out x^2

$\frac{1}{3} \int e^u$ — Take constant out & Solve Integral

$\frac{1}{3} e^{x^3}$ — Our Solution