MATH 212: Calculus II SP24 MQ LT1

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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?

$$\int \frac{\ln(x)}{x^2}dx \qquad \int \ln(x)\cdot\frac{1}{x^2}\,dx$$

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

I would use integration by parts because u-sub would't work here. There is no composite function.

(b) Evaluate the integral. **Neatly write out your solution process, and include some words or phrases of explanation.**

$\int \frac{\ln(x)}{x^2}$ $uv-\int v\,du$ $u=\frac{1}{x^2}$ $dv=\ln(x)$

$du=$ ~~$\frac{2}{x^3}$~~ $v=\frac{1}{x}$

~~$\ln(x)$~~

$\frac{1}{x^3}-\int \frac{1}{2x^3}\,dx$ $\frac{1}{2x^3}$

$\ln^3(x)-2\ln(x^3)+C$