

1. Evaluate the following integrals using integration by parts, and *check your answers!!*

(a) $\int x \ln(x) dx$

(b) $\int x^3 e^{x^2} dx$ (Hint: $u = x^2$ and $dv = xe^{x^2} dx$)

(c) $\int \ln(x) dx$ (Hint: $u = \ln(x)$ and $dv = dx$)

(d) $\int e^x \cos(x) dx$

2. Find the volume when the region bounded by $y = \sin(x)$ and the x -axis for $0 \leq x \leq \pi$ is rotated about the y -axis.