

WRITE YOUR NAME:

MAC 2312 Quiz 9
Thursday February 15th

$$\int u dv = uv - \int v du$$
$$\int_{x=a}^{x=b} u dv = [uv]_{x=a}^{x=b} - \int_{x=a}^{x=b} v du$$

Evaluate the integral.

$$\int_0^{\pi} x \sin x dx$$

Try parts. $u = x$
 $dv = \sin x dx$ $\left. \begin{array}{l} \rightarrow du = dx \\ v = -\cos x \end{array} \right\}$

$$\int_0^{\pi} \underbrace{x}_{u} \underbrace{\sin x dx}_{dv} = \left[\underbrace{x}_{u} \cdot \underbrace{(-\cos x)}_v \right]_0^{\pi} - \int_0^{\pi} \underbrace{(-\cos x)}_v \cdot \underbrace{dx}_{du}$$

$$= \left[x \cos x \right]_{\pi}^0 + \int_0^{\pi} \cos x dx$$

$$= \underbrace{0 \cos 0}_0 - \underbrace{\pi \cos \pi}_{-1} + \left[\sin x \right]_0^{\pi}$$

$$= -\pi \cdot (-1) + (\underbrace{\sin \pi}_0 - \underbrace{\sin 0}_0) = \boxed{\pi}$$