

Name:

Section: 5 6 9 10

1. Find $\lim_{x \rightarrow \infty} (\ln x)^{1/x}$ Type ∞^0

$$\text{Set } L = \lim_{x \rightarrow \infty} (\ln x)^{1/x}$$

$$\Rightarrow \ln L = \lim_{x \rightarrow \infty} \frac{\ln(\ln x)}{x} \quad \text{Type } \frac{\infty}{\infty}$$

$$\stackrel{H}{=} \lim_{x \rightarrow \infty} \frac{1}{\ln x} \cdot \frac{1}{x}$$

$$= 0$$

2. Use integration by parts to evaluate $\int x \cos(2x) dx$

$$u = x \quad dv = \cos(2x) dx$$

$$du = dx \quad v = \frac{1}{2} \sin(2x)$$

$$= \frac{1}{2} x \sin(2x) - \int \frac{1}{2} \sin(2x) dx$$

$$= \frac{1}{2} x \sin(2x) + \frac{1}{4} \cos(2x) + C$$