Name: Solutions Section: 7 8

1. Find $\lim_{x\to 0^+} (\cos x)^{7/x}$

Type 1^∞

Let $L = \lim_{x\to 0^+} (\cos x)^{7/x}$

$\Rightarrow \ln L = \lim_{x\to 0^+} \frac{7\cdot \ln(\cos x)}{x}$ Type $\frac{0}{0}$

$\overset{H}{=} 7 \cdot \lim_{x\to 0^+} \frac{\frac{-\sin x}{\cos x}}{1}$

$= 7 \cdot \frac{\frac{-\sin(0)}{\cos(0)}}{1} = 0$ $\quad \therefore L = e^0 = 1.$

2. Use integration by parts to evaluate $\int xe^{2x}dx$

$u = x \qquad dv = e^{2x}dx$

$du = dx \qquad v = \frac{1}{2}e^{2x}$

$= \frac{xe^{2x}}{2} - \int \frac{1}{2}e^{2x}dx$

$= \frac{xe^{2x}}{2} - \frac{1}{4}e^{2x} + C$