Homework 12

Due Friday, November 14, 2008

NOTA BENE: The second midterm is scheduled for Monday, November 17.

(a) On page 622, section 12.8, do problems: 1, 4, 8, 20, 33, 35.

(b) Divide the Taylor series for $(1 - \cos x)$ by x^2 to find a Taylor series for

$$\frac{1 - \cos x}{x^2}$$

around 0. Use this series to determine $\lim_{x \to 0} \frac{1 - \cos x}{x^2}$ without invoking l'Hôpital's rule.

(c) Set $f(x) = \frac{1}{1 - 3\,x + x^2}$. Use long division to find the first four terms (i.e., x^0 through x^3) of a Taylor series for $f(x)$ around 0. Using this Taylor series, determine $f^{(3)}(0)$ without performing any differentiation.