Homework #11.

Find the following limits. Apply l'Hopital's rule, if necessary.

a) $\lim_{x \to 0} \frac{\cos x - 1}{x^2}$;

b) $\lim_{t \to 0} \frac{t \sin t}{1 - \cos(2t)}$;

c) $\lim_{\theta \to \pi/2} \frac{1 - \sin\theta}{1 + \cos(2\theta)}$;

d) $\lim_{t \to \infty} \frac{e^t + 100t}{e^t + t^2}$;

e) $\lim_{x \to 1^+} \left(\frac{1}{x-1} - \frac{1}{\ln x} \right)$;

f) $\lim_{x \to \infty} (1 + 2x)^{\frac{1}{2 \ln x}}$;

g) $\lim_{x \to 0} (1 + 2x^2)^{\frac{1}{x^2}}$;

h) $\lim_{x \to 0} x \ln x^2$;

i) $\lim_{x \to \infty} \frac{2^x + 4^x}{3^x - 4^x}$;

j) $\lim_{x \to \infty} x^{\frac{1}{x}}$.