NAME:_____

HOMEWORK FOR WORKSHEET 2 MATH 1300 DUE JANUARY 25, 2008

1. Apply the approach developed in Worksheet 2 to evaluate each of the following limits:

a. $\lim_{x \to -1} \dfrac{x^2 + 4x + 3}{x^2 - 2x - 3}$.

b. $\lim_{x \to 2} \dfrac{x^3 - 2x^2 - 4x + 8}{x^2 - 4x + 4}$.

c. $\lim_{x \to -2} \dfrac{x^3 + x^2 + x + 1}{x^3 + 3x^2 + x}$.

2. Sometimes it is also possible to simplify a function of the form $f(x) = \dfrac{g(x)}{h(x)}$ in order to evaluate a limit $\lim\limits_{x \to a} \dfrac{g(x)}{h(x)}$, when $g(a) = 0$ and $h(a) = 0$. Try to evaluate each of the following limits by first simplifying the function:

a. $\lim\limits_{x \to 0} \dfrac{\sin^2(x)}{1 - \cos(x)}$ (Hint: use the well-known trig identity $\sin^2(x) + \cos^2(x) = 1$)

b. $\lim\limits_{x \to 4} \dfrac{x - 4}{\sqrt{x} - 2}$ (Hint: try to factor the numerator; alternatively, multiply the numerator and denominator by the conjugate of the denominator)

c. $\lim\limits_{x \to 1} \dfrac{x - 1}{\sqrt[3]{x} - 1}$ (Hint: use ideas similar to part b.)