**M317   Assignment #5    due Friday**

For each of the following limits, use the definition of function limit to find an L such that
$\lim_{x \to c} f(x) = L$ and prove it (i.e., find $\delta(\varepsilon)$ or $B(\varepsilon)$ )

1. $\lim\limits_{x \to 2} \dfrac{x^2 - x - 2}{x^2 + 2x - 8}$

2. $\lim\limits_{x \to 1} \dfrac{x}{x + 1}$

3. $\lim\limits_{x \to 0} \dfrac{1 - Cos(x)}{x}$

4. $\lim\limits_{x \to \infty} \dfrac{Cos(x)}{x^2}$

5. $\lim\limits_{x \to \infty} \dfrac{x}{1 + x^2}$

Use the sequential definition of function limit to show the following limits fail to exist

6. $\lim\limits_{x \to 0} Cos(\frac{1}{x})$

7. $\lim\limits_{x \to 0} f(x)$    where  $f(x) = \begin{cases} 2 & if\ x > 2 \\ -2 & if\ x < 2 \end{cases}$