MATH153 - Homework 2

Due: March 22

1. Using formal definition of limit show the following:
   (a) $\lim_{x \to 1} \frac{2}{(x-1)^2} = \infty$
   (b) $\lim_{x \to 1} (5x - 2) = 3$
2. Is $f(x)$ continuous everywhere? If it is continuous, find a. If it is not continuous, explain why?
$$f(x) = \begin{cases} \frac{-sin(x)}{x} & \textbf{if } x \neq 0 \\ x^2 cos(x) + a^3 x + a^2 + a & \textbf{if } x = 0 \end{cases}$$
3. Find a continuous extension for $f(x) = \frac{-sinx}{x}$