Calculus 1510 - Tutorial #1

1. Evaluate each of the following limits, if it exists. If it does not exist, does it tend to ∞, $-\infty$ or neither? Show your work, or otherwise explain how you got your answer.

   (a) $\lim_{x\to 3^+} \dfrac{x+3}{\sqrt{x-3}}$

   (b) $\lim_{x\to 1} \dfrac{3-\sqrt{6x+3}}{x-1}$

   (c) $\lim_{x\to 0} \dfrac{\sin 4x}{\sin 2x}$

   (d) $\lim_{x\to 3} \dfrac{x^3-27}{x^2+2x-15}$

   (e) $\lim_{x\to 0} \dfrac{\sqrt{1-x}-\sqrt{1+x}}{x}$

   (f) $\lim_{x\to 3^-} \dfrac{x^3-3x^2}{|x-3|}$

2. Suppose that $\lim_{x\to 3} \dfrac{f(x)}{g(x)} = 6$ and $\lim_{x\to 3} g(x) = 0$. What is the value, if any, of $\lim_{x\to 3} f(x)$?