Math 2A Worksheet: 2.3 Calculating Limits

Write your names and Student ID numbers at the top of the page

1. Evaluate the limits, if they exist: justify each step using the limit laws.

   (a) $\lim_{x \to -1} (x^4 - 3x)(x^2 + 5x + 3)$

   (b) $\lim_{x \to -3} \dfrac{x^2 + 3x}{x^2 - x - 12}$

   (c) $\lim_{h \to 0} \dfrac{(2+h)^3 - 8}{h}$

   (d) $\lim_{x \to 0} \left(\dfrac{1}{x} - \dfrac{1}{|x|} \right)$

   (e) $\lim_{x \to -4} \dfrac{\sqrt{x^2 + 9} - 5}{x + 4}$

2. If $2x \leq g(x) \leq x^4 - 4x + 7$ for all x, evaluate $\lim_{x \to 1} g(x)$.

3. Show that $\lim_{x \to 0} x^4 \cos \frac{2}{x} = 0$.

4. Show that $\lim_{x \to 0^+} \sqrt{x}(e^{\sin(\pi/x)}) = 0$.