MAT 241 Section 07 Fall 2009
Problem Set 4
Assigned 9/16/09
Due 9/21/09

2. The graphs of f and g are given in 2.3.2.png. Use them to evaluate each limit, if it exists. If the limit does not exist, explain why.

a. $\lim_{x\to 2}[f(x)+g(x)]$ b. $\lim_{x\to 1}[f(x)+g(x)]$
c. $\lim_{x\to 0}[f(x)\cdot g(x)]$ d. $\lim_{x\to -1}\dfrac{f(x)}{g(x)}$
e. $\lim_{x\to 2}[x^3 f(x)]$ f. $\lim_{x\to 1}\sqrt{3+f(x)}$

3. Evaluate the limit and justify each step by indicating the appropriate Limit Law(s).

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

7. Evaluate the limit and justify each step by indicating the appropriate Limit Law(s).

$$\lim_{x\to 1}\left(\frac{1+3x}{1+4x^2+3x^4}\right)^3$$

8. Evaluate the limit and justify each step by indicating the appropriate Limit Law(s).

$$\lim_{u\to -2}\sqrt{u^4+3u+6}$$

11. Evaluate the limit, if it exists.

$$\lim_{x\to 2}\frac{x^2+x-6}{x-2}$$

17. Evaluate the limit, if it exists.

$$\lim_{h\to 0}\frac{(4+h)^2-16}{h}$$

23. Evaluate the limit, if it exists.

$$\lim_{x\to 7}\frac{\sqrt{x+2}-3}{x-7}$$

29. Evaluate the limit, if it exists.

$$\lim_{t\to 0}\left(\frac{1}{t\sqrt{1+t}}-\frac{1}{t}\right)$$

33. Use the Squeeze Theorem to show that:

$$\lim_{x \to 0}(x^2 \cos(20\pi x)) = 0$$

Illustrate by graphing the functions $f(x) = -x^2$, $g(x) = x^2 \cos(20\pi x)$, and $h(x) = x^2$ on the same screen or graph.

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