

Review Problems

September 7, 2016

1. (Fall 2002, Exam 1, #5) Find the following limits or show that they do not exist:

(b) $\lim_{x \rightarrow -4} \frac{x^2 + x - 12}{x + 4}$

(c) $\lim_{x \rightarrow 0} |x| \cos \frac{\pi}{x^2}$

2. (Fall 2005, Exam 1, #1) For which functions is it true that $\lim_{x \rightarrow 1} f(x) = 2$?

I. $f(x) = \frac{4x - 4}{x^2 - 1}, x \neq \pm 1$

II. $f(x) = \begin{cases} x + 1 & x > 1 \\ x - 1 & x \leq 1 \end{cases}$

III. $f(x) = x^2 + 1$

3. (Fall 2005, Exam 1, #2) If $-x^2 + 1 - x \leq g(x) \leq x^2 - x + 1$ for all x , then find $\lim_{x \rightarrow 0} g(x)$.

4. (Fall 2005, Exam 1, #3) $\lim_{x \rightarrow 1} \sqrt{\frac{x^2 + 2x - 3}{x - 1}}$

5. (Fall 2005, Exam 1, #4) $\lim_{x \rightarrow 3} \frac{x - 3}{\sqrt{x} - \sqrt{3}}$

6. (Fall 2006, Exam 1, #9) $\lim_{x \rightarrow 1} \frac{\sqrt{2x + 5} - \sqrt{7}}{x - 1}$

7. (Fall 2009, Exam 1, #9) Evaluate $\lim_{x \rightarrow -4} \frac{3x^2 - 48}{x^2 + 2x - 8}$ if it exists.

8. (Fall 2009, Exam 1, #10) Evaluate $\lim_{t \rightarrow 3} \frac{\sqrt{t + 1} - 2}{t - 3}$ if it exists.