

Honors 125
Problems on limits

Due Wednesday, October 21, 2009

Find the following limits, if they exist. If not, write DNE. If you cannot find a solution algebraically, use a calculator and a table of values.

1. $\lim_{x \rightarrow -3} \frac{x+3}{x^2+4x+3}$

2. $\lim_{x \rightarrow 2} \frac{x+1}{x-2}$

3. $\lim_{x \rightarrow -1} \frac{x+1}{x^2-1}$

4. $\lim_{x \rightarrow -1} \frac{x^2-1}{x^2-2x+1}$

You will need tables of values for the following four problems:

5. $\lim_{x \rightarrow 0} \frac{2e^{3x}-2}{x}$

6. $\lim_{x \rightarrow 0} \frac{|x|}{x}$ (Be sure to check the limit from both above and below $x = 0$.)

7. $\lim_{x \rightarrow 0^+} x^x$

8. $\lim_{x \rightarrow 1} \frac{x^5-1}{x-1}$

9. $\lim_{x \rightarrow \infty} \frac{x^2-1}{3x^4-7x^2}$

10. Section 3.3, #30, 32, 34

11. Let $f(x) = \begin{cases} 6x - 2, & \text{if } x < 1 \\ 7, & \text{if } x = 1 \\ -x + 5, & \text{if } x > 1 \end{cases}$

a) Find $\lim_{x \rightarrow 3} f(x)$, if it exists.

b) Find $\lim_{x \rightarrow 1^+} f(x)$, if it exists.

c) Find $\lim_{x \rightarrow 1^-} f(x)$, if it exists.

d) Find $\lim_{x \rightarrow 1} f(x)$, if it exists.

e) Find $f(1)$, if it exists.