Extra Credit Opportunity TODAY:
5:00-5:30pm Mon 10/20 in S205 - Math League Competition

HW Due Thurs 10/23:
3.9 #5, 9; 11-19 odd; 45, 49

Test #4: Thurs 10/23
primarily on sections 3.5,3.7,and 7.7, with some review and 1 or 2 questions from 3.9

HW Due Fri 10/24:
handout packets:

- graphs
- multiple choice AP calculus problems
- final exam practice problems
- sudoku, etc. worksheets

Exam: 9:00am Wed 10/29

- All A's on all 4 tests (after bonus pts) --> exempt from final (unless you want to take it because HW and quizzes are keeping you from an A in the class)
- Lowest of 4 regular test grades will be dropped (if it helps you)
- Final Exam can replace 2nd lowest test grade (if it helps you)

$\lim_{x\to 0} \frac{e^x-(1-x)}{x} = \frac{0}{0} = \lim_{x\to 0} \frac{e^x+1}{1} = \frac{1+1}{1} = 2$

$\lim_{x\to\infty} \frac{x^2}{\sqrt{x^2+1}} = \lim_{x\to\infty} \frac{x^2}{\sqrt{x^2}} = \lim_{x\to\infty} \frac{x^2}{|x|} = \lim_{x\to\infty} \frac{x^2}{x} = \lim_{x\to\infty} x = \infty$

$\lim_{x\to\infty} \frac{\sin x}{x-\pi} = 0$

$\lim_{x\to\infty} \frac{\ln x^4}{x^3} = \lim_{x\to\infty} \frac{\frac{1}{x^4}\cdot 4x^3}{3x^2} = \lim_{x\to\infty} \frac{4}{3x^3} = 0$

$\frac{1}{x^4}\cdot\frac{4x^3}{3x^2}$

$\lim_{x\to\infty} \frac{2x^3-5x+1}{4x^3-3x^2+x+25} = \lim_{x\to\infty} \frac{2x^3}{4x^3} = \boxed{\frac{1}{2}}$

$\lim_{x\to-\infty} \frac{-2x+5}{\sqrt{x^2+2x}} = \lim_{x\to-\infty} \frac{-2x}{\sqrt{x^2}} = \lim_{x\to-\infty} \frac{-2x}{|x|}$

$= \lim_{x\to-\infty} \frac{-2x}{-x} = \boxed{2}$

Find the horizontal asymptotes. $f(x) = \frac{5x}{\sqrt{x^2+5}} \approx \frac{5x}{|x|} = \begin{cases} \frac{5x}{x} = 5, & x>0 \\ \frac{5x}{-x} = -5, & x<0 \end{cases}$

$y=5$ & $y=-5$

Optimization problems:

1. If I have 200 meters of fence to make a rectangular yard attached to the side of my barn, what dimensions will yield the max. area?

2. The sum of two numbers is -753. What are the two numbers if their product is a maximum?

★ replace #16 on Final Exam practice problems w/ these