

Math 32 A: HW5 Due Friday, November 7, 2008

- **Homework Details**

1. Only use the front side of the paper.
2. Write your name, ID number and section number on the back of the last page.
3. Homework will be graded on a 10 point scale. Three problems (chosen by the instructor) will be graded for 2 points each, and 4 points will be given for completeness of your work.
4. HW due at the end of class. No credit for late HW, no exceptions.

Assigned Problems

- **Section 15.2**

Problems 29-34

- **Section 15.3**

Problems 5,6,15-24,45,46,72a-d,89

- Show that for all $\epsilon > 0$, there is a $\delta > 0$ such that if $|x - a| < \delta$ then

$$|f(x) - f(a)| < \epsilon$$

with $f(x) = mx + b$.

- Let $f(x, y) = \frac{5x^2y}{2x^4+3y^2}$
 - a. What is the domain of f ?
 - b. As (x, y) approaches $(0, 0)$ on the line $y = 2x$, what happens to $f(x, y)$?
 - c. As (x, y) approaches $(0, 0)$ on the line $y = 3x$, what happens to $f(x, y)$?
 - d. As (x, y) approaches $(0, 0)$ on the parabola $y = x^2$, what happens to $f(x, y)$?
 - e. Does $\lim_{(x,y) \rightarrow (0,0)} f(x, y)$ exist? If so, what is it?

- **Extra Credit:** Show that for all $\epsilon > 0$, there is a $\delta > 0$ such that if $\sqrt{(x^2 + y^2 + z^2)} < \delta$ then

$$|f(x, y, z) - 0| < \epsilon$$

with $f(x, y, z) = \frac{3x^2y}{(\frac{x}{2})^2 + 2y^2 + 3z^2} + x$.