"QUIZ" for Lecture 6

NAME: (print!) Daniel Gameiro **Section:** 23

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q6FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 24, 8:00pm

1. Find the limit if it exists, or show that the limit does not exist.

$$\lim_{(x,y)\to(0,0)} \frac{2x}{2x+3y} \quad .$$

Plugging in gives $\frac{0}{0}$, so Lets try $y = cx$

$$\lim_{x\to 0} \frac{2x}{2x+3cx} = \lim_{x\to 0} \frac{2x}{x(2+3c)} = \lim_{x\to 0} \frac{2}{2+3c}$$

The limit depends on c, therefore this limit doesn't exist.

2. Find the limit if it exists, or show that the limit does not exist.

$$\lim_{(x,y)\to(0,0)} \frac{x^5}{x^2+y^2} \quad .$$

Plugging in gives $\frac{0}{0}$, so Lets try $y = cx$

$$\lim_{x\to 0} \frac{x^5}{x^2+(cx)^2} = \lim_{x\to 0} \frac{x^5}{x^2(1+c^2)} = \lim_{x\to 0} \frac{x^3}{1+c^2} = 0$$

There might be a limit, so lets try polar:

$$\lim_{r\to 0} \frac{(r\cos\theta)^5}{r^2} = \lim_{r\to 0} \frac{r^5\cos^5\theta}{r^2} = \lim_{r\to 0} r^3\cos^5\theta = 0$$

The limit exists and equals 0.