"QUIZ" for Lecture 6

NAME: (print!) Afsana Rahman 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.

$\lim_{(x,y)\to(0,0)} \frac{2x}{2x+3y}$ = undefined after plugging in

$(y-b) = c(x-a)$

$y = cx$

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

LIMIT DOES NOT EXIST : different limits when approaching the point w/different lines of different slopes of c

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

$\lim_{(x,y)\to(0,0)} \frac{x^5}{x^2+y^2}$ = undefined after plugging in

$(y-b) = c(x-a)$

$y = cx$

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

$= \lim_{x\to 0} \frac{x^3}{1+c^2} = \emptyset$ (the limit could exist)

$f(r\cos\theta, r\sin\theta) = \frac{r^5\cos^5\theta}{r^2\cos^2\theta + r^2\sin^2\theta} = \frac{r^5\cos^5\theta}{r^2(\cos^2\theta+\sin^2\theta)} = r^3\cos^5\theta$

$(\cos^2\theta+\sin^2\theta) = 1$

$x = r\cos\theta, y = r\sin\theta$

$\lim_{r\to 0} r^3\cos^5\theta = \emptyset$

LIMIT DOES EXIST AND IS EQUAL TO ZERO.