Calc 251 Lecture 6 Quiz (PDF)

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

$y = cx$ for $y-b = c(x-a)$ $\quad (a,b) = (0,0)$

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

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

Limit DNE since there are different limits for different lines

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

$y = cx$

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

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

The limit exists and it equals 0