Calc 3 - HW 13

Note Title 10/6/2011

(1) Find the following limits or show that they do not exist.

a) $\lim_{(x,y)\to(1,0)} \frac{1+y^2}{x^2+xy}$

b) $\lim_{(x,y)\to(0,0)} \frac{xy\cos(y)}{3x^2+y^2}$

c) $\lim_{(x,y)\to(0,0)} \frac{6x^3y}{2x^4+y^4}$

d) $\lim_{(x,y)\to(0,0)} \frac{x^4-y^4}{x^2+y^2}$

e) $\lim_{(x,y)\to(0,0)} \frac{xy^4}{x^2+y^8}$

(2) Is the following function continuous:

$$f(x,y) = \begin{cases} \frac{5x^2y}{x^2+y^2} & , \text{ if } (x,y)\neq(0,0) \\ 0 & , \text{ if } (x,y)=(0,0) \end{cases}$$

(3) If $f(x,y)=\sqrt{4-x^2-4y^2}$, find $f_x(1,0)$ and $f_y(1,0)$

(4) Find partial deriv. f_x, f_y, and if appropriate f_z

a) $f(x,y) = x^4y^3+8x^2y$

b) $f(x,y) = \frac{x-y}{x+y}$

c) $f(x,y,z) = x\sin(y-z)$

d) $f(x,y,z) = xyz^2\tan(z)$