Quiz 5 (35mins, 30pts)

Please write down your name, SID, and solutions discernably.

Name : SID : Score :

1. (10pts : 5pts each) Find the limit, if it exists, or show that the limit does not exist.

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

   b)
   $$\lim_{(x,y)\to(0,0)} \frac{xye^y}{\sqrt{x^2+y^2}}$$

2. (10pts : 5pts each) Find the first partial derivatives of the function.

   a) $f(a,b) = a^{1/3}\ln b$

b) $\varphi(x, y, z, t) = \dfrac{\sin^2 x + \sin^2 z}{\cos y + \cos t}$

3. (10pts : 5pts each) Find an equation of the tangent plane to the given surface at the specified point.

a) $z = 3\cos x - 2\sin y + 5, \quad (\pi, \frac{\pi}{2}, 0)$

b) $z = -2\ln x + (y+1)^2 - 1, \quad (e, -3, 1)$