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

a) $\lim_{(x,y)\to(0,0)} \dfrac{y^2 \sin^2 x}{x^4+y^4}$ b) $\lim_{(x,y)\to(0,0)} \dfrac{xy^2e^y}{x^4+4y^2}$ c) $\lim_{(x,y)\to(0,0)} \dfrac{x^4-y^4}{x^2+y^2}$

d) $\lim_{(x,y)\to(0,0)} \dfrac{x^2 \sin^2 y}{x^2+2y^2}$ e) $\lim_{(x,y)\to(0,0)} \dfrac{x^2+y^2}{\sqrt{x^2+y^2+1}-1}$ f) $\lim_{(x,y,z)\to(0,0,0)} \dfrac{xy+yz^2+xz^2}{x^2+y^2+z^4}$

2. Find the first partial derivatives of the function.

a) $f(x,t) = \sqrt{x}\ln t$ b) $f(x,y,z) = ze^{xyz}$ c) $\phi(x,y,z,t) = \frac{\alpha x+\beta y^2}{\gamma z+\delta t^2}$

3. Find an equation of the tangent plane to the given surface at the specified point.

$$z = 3(x-1)^2 + 2(y+3)^2 + 7, \quad (2,-2,12)$$

Course Homework due Feb 26, Wed.

Feb 17, Mon. : Presidents' Day
Feb 19, Wed. : **14.3** 15, 17, 19, 21, 23, 35, 39, 41, 45, 47
Feb 21, Fri. : **14.4** 1, 3, 5, 13, 17, 19, 21, 25, 27, 29