HW26

(1) Find the line tangent to the curve $x^4 + xy + x^6 = 3$ at $(1,1)$.

(2) Find the plane tangent to the surface $x^3 + y^3 + z^3 - 3xyz = 7$ at $(2,2,1)$.

(3) Find the direction of fastest increase of $f(x,y) = x^{-2} + y^{-3}$ at $(1,1)$.

(4) Find the direction of fastest decrease of $g(x,y,z) = x^2 + \left(\frac{y-z}{2}\right)^2 + \left(\frac{z-x}{3}\right)^2$ at $(-3,-4,-5)$.