Javier Andrés Munguía Schürzano
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#7 HT

M. Intermedia 2

#1) $f(x,y,z) = xy^2 + 3x^2 - z^3$ $\quad f(x,y,z)$ en $(2,-1,4)$

$f(2,-1,4) = ?$

$Df(x,y,z)$ en $(2,1,4)$ + $\quad f(x,y,z) = f_x\hat{i} + f_y\hat{j} + f_z\hat{k}$

$= (y^2+6x)\hat{i} + (2xy)\hat{j} + (-3z^2)$

$f(2,1,4) = ((-1)^2 + 12)\hat{i} + (-4)\hat{j} + (-3(4)^2)$

$f(2,1,4) = 13\hat{i} - 4\hat{j} - 48\hat{k}$

$\boxed{13\hat{i} - 4\hat{j} - 48\hat{k}}$

#2) $f(x,y) = 2x^2y^3$ en $(1,1)$ eje $\frac{\pi}{6}$

$f(x,y) = 2x^2y^3$, $P(1,1)$, $\theta \frac{\pi}{6}$

$Df(x,y) = (4xy^3)\hat{i} + (6x^2y^2)\hat{j}$

$Df(1,1) = (4(1)(1^3))\hat{i} + (6(1)^2(1)^2)\hat{j} = 4\hat{i} + 6\hat{j}$

$D_u f(1,1) = U \cdot Df$

$U = \langle \cos\theta, \operatorname{sen}\theta \rangle - \langle \cos(\frac{\pi}{6}), \operatorname{Sen}(\frac{\pi}{6}) \rangle = \langle \frac{\sqrt{3}}{2}, \frac{1}{2} \rangle$

$D_u f(1,1) = \langle \frac{\sqrt{3}}{2}, \frac{1}{2} \rangle \langle 4, 6 \rangle$

$D_u f(1,1) = 2\sqrt{3} + 3$

$\boxed{2\sqrt{3} + 3}$

NAC