

Escuela Politécnica Nacional

Carrera: Ingeniería Química

Materia: Cálculo Vectorial

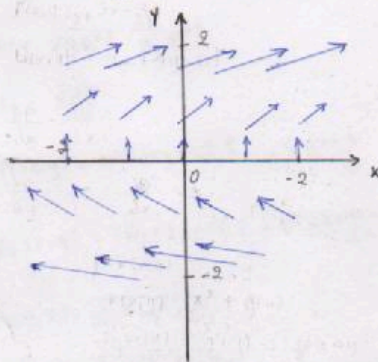
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Fecha: 2015-01-27

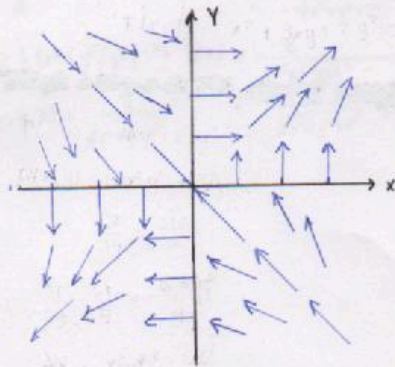
Tema: 16.1 Campos vectoriales

Trace el campo vectorial F en un diagrama como la figura 5.0 la figura 9.

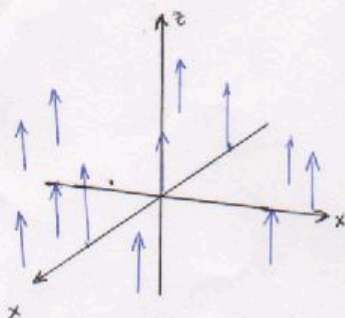
3. $F(x,y) = \frac{y\hat{i} + x\hat{j}}{\sqrt{x^2 + y^2}}$



3. $y\hat{i} + \frac{1}{2}\hat{j}$



7. $F(x, y, z) = k$



Determine el campo vectorial gradiente de f .

21. $f(x, y) = xe^{xy}$

$$f_x = xy e^{xy} + e^{xy}$$

$$f_y = x^2 e^{xy}$$

$$\nabla f(x, y) = e^{xy}(xy + 1) \hat{i} + x^2 e^{xy} \hat{j}$$

$$\nabla f(x, y) = (xy + 1)e^{xy} \hat{i} + x^2 e^{xy} \hat{j}$$

23. $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$

$$f_x = \frac{1}{\sqrt{x^2 + y^2 + z^2}} (x) = \frac{x}{\sqrt{x^2 + y^2 + z^2}}$$

$$f_y = \frac{1}{\sqrt{x^2 + y^2 + z^2}} (y) = \frac{y}{\sqrt{x^2 + y^2 + z^2}}$$

$$f_z = \frac{1}{\sqrt{x^2 + y^2 + z^2}} (z) = \frac{z}{\sqrt{x^2 + y^2 + z^2}}$$

$$\nabla f(x, y, z) = \frac{x}{\sqrt{x^2 + y^2 + z^2}} \hat{i} + \frac{y}{\sqrt{x^2 + y^2 + z^2}} \hat{j} + \frac{z}{\sqrt{x^2 + y^2 + z^2}} \hat{k}$$