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Curso: Engenharia de Software

Lista 12 - Campos vetoriais

$$1) A) f(x, y) = x e^{xy} \leadsto \nabla f = \left(\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y} \right)$$

$$\bullet \frac{\partial f}{\partial x} = x' \cdot e^{xy} + x \cdot e^{xy'} \leadsto 1 \cdot e^{xy} + x \cdot e^{xy} \cdot y$$

$$\frac{\partial f}{\partial x} = e^{xy} + xy e^{xy}$$

$$\bullet \frac{\partial f}{\partial y} = \cancel{x' \cdot e^{xy}} + x \cdot e^{xy'} \leadsto x \cdot e^{xy} \cdot x$$

$$\frac{\partial f}{\partial y} = x^2 e^{xy}$$

$$R = \nabla f = \langle e^{xy} + xy e^{xy}, x^2 e^{xy} \rangle$$

$$1) B) f(x, y) = \tan(3x - 4y) \quad \nabla f = \left(\frac{\partial f}{\partial x}, \frac{\partial f}{\partial y} \right)$$

$$\cdot \frac{\partial f}{\partial x} = \sec^2(3x - 4y) \cdot 3$$

$$\cdot \frac{\partial f}{\partial y} = \sec^2(3x - 4y) \cdot (-4)$$

$$\nabla f = \langle 3 \sec^2(3x - 4y), -4 \sec^2(3x - 4y) \rangle$$

$$1) C) f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$$

Fiquei em dúvida na 1) C)

2.

$$\vec{v}(x, y) = \langle x^2, x + y^2 \rangle$$

$$P = (2, 1)$$

$$T = 32$$

$$V(2, 1) = \langle 2^2, 2 + 1^2 \rangle = \langle 4, 3 \rangle$$

$$S(x, y) = \langle 4, 3 \rangle \cdot 0,01$$

$$\langle 0,04; 0,03 \rangle$$

$$(2, 1) + (0,04; 0,03)$$

$$(2,04; 1,03)$$

$$R = (2,04; 1,03)$$

3. $T = 15$

$$P = (1, 3)$$

$$\vec{v}(x, y) = \langle xy - 2, y^2 - 10 \rangle$$

$$\vec{v}(1, 3) = \langle 1 \cdot 3 - 2, 3^2 - 10 \rangle = \langle 1, -1 \rangle$$

$$\langle 1, -1 \rangle \cdot 0,05 = \langle 0,05; -0,05 \rangle$$

$$(1, 3) + (0,05; -0,05)$$

$$(1,05; 2,95)$$