$$\frac{\partial M}{\partial X} + \frac{\partial V}{\partial Y} = FLUX$$

$$\frac{\partial M}{\partial X} - \frac{\partial M}{\partial Y} = CL \quad UNIVERSIDADE FEDERAL DO CEARÁ CAMPUS SOBRAL$$

ENGENHARIA ELÉTRICA

Cálculo Vetorial - Turma 02

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Consulte os dados da sua prova na plataforma www.calculo.sobral.ufc.br.

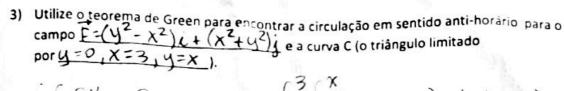
1) Utilize o teorema de Green para encontrar a circulação em sentido anti-horário para campo F=(x-y); + (y-x); e a curva C (o quadrado limitado por x=0, x=1, y=0, y=1

$$\left\{ \left\{ \frac{\partial V}{\partial x} - \frac{\partial M}{\partial y} \right\} dydx \right\} \Rightarrow \left\{ \left\{ \left\{ -1 - (-1) \right\} dydx \right\} \right\} \\
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2) Utilize o teorema de Green para encontrar o fluxo em sentido anti-horário para o campo F = (x-y) i + (y - x) e a curva C (o quadrado limitado por x=0, x=1, y=0, y=1).

$$\iint \frac{\partial M}{\partial x} + \frac{\partial N}{\partial y} dy dx = \iint 1 + 1 dy dx = 5$$

$$\Rightarrow \int_{0}^{1} \int_{0}^{1} 2 dy dx = \int_{0}^{1} 2 y \int_{0}^{1} dx = \int_{0}^{1} 2 dx = 0$$



$$\int_{C} \frac{\partial v}{\partial x} - \frac{\partial w}{\partial y} dydx = \int_{0}^{3} \int_{0}^{x} (2x - 2y) dydx = 0$$

=>
$$\int_{0}^{3} \left[2xy - y^{2} \right]_{0}^{x} dx = \int_{0}^{3} \left(2x^{2} - x^{2} \right) dx =>$$

$$\int_{0}^{3} x^{2} dx = \frac{x^{3}}{3} \Big|_{0}^{3} = \frac{3^{3}}{3} = \frac{27}{3} = 9$$

4) Qual o fluxo
$$\frac{1}{\sqrt{5}}$$
 $\frac{1}{\sqrt{5}}$ $\frac{1}{\sqrt{5}}$

$$\text{wt } \vec{F} = (0 - 2y) i + (0 - 23) j + (0 - 2x) k
 = -2yi - 23j - 2k - 42, 4724
 3 = 6 - x - y$$

$$= -2yi - 2(6-x-y)j - 2x K$$

$$= -2yi - (12-2x-2y)j - 2x K$$

$$2y = -2i + 2i + 0k$$

$$-2 - 2i + 2i + 0k$$

$$-2 - 3k - 4i - (-4i - 4k)$$

$$0 - 2 - 2 - 0 - 0 - 4i + 4i + 4k$$

OBS: A respostas devem ser enviadas a plataforma até o horário marcado para o fimí dessa prova, mas lembre de que o desenvolvimento escrito é muito relevante na nota.