

(2)

(2) $F = (x-y; x-y)$

a) $\text{rot } F = \frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} = (1 - -1) \underline{1} = 2 \underline{1}$

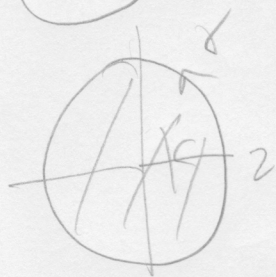
$$\text{div } F = \frac{\partial P}{\partial x} + \frac{\partial Q}{\partial y} = 1 - 1 = 0$$

$$G = (y-x, x-y)$$

$$\text{rot } G = (1 - 1) \underline{1} = 0 \underline{1} = 0$$

$$\text{div } G = -1 - 1 = -2$$

(2b)



$$\int_{\gamma} F \cdot d\gamma = \int_{\underline{K}} \text{rot } F \cdot \underline{1} dx dy = \int \int_{\underline{K}} 2 dx dy$$

$$= 2 (\text{área } \underline{K}) \cdot 2 \cdot \frac{1}{4} \pi = 8\pi$$

$$\nwarrow \pi R^2 = 4\pi$$

$$\int_{\gamma} G \cdot d\gamma = \int \int_{\underline{K}} \text{rot } G \cdot \underline{1} dx dy = \boxed{0}$$