ES. 1

Sia $\Gamma = \{(x_1, x_2, x_3) \in \mathbb{R}^3 \mid (x_1 - 3)^2 + x_2^2 = 1, \ x_2 \geq 0, \ |x_3| \leq 1\}$

Calcolare $\displaystyle\int_\Gamma \frac{x_2 \, x_3^2}{x_1^2 + x_2^2} \, d\sigma$

Es 2

Siano $A = \{(x_1, x_2) \in \mathbb{R}^2 \mid x_1^2 + x_2^2 \leq 1\}$, $f : \mathbb{R}^2 \to \mathbb{R}$ $\quad f(x_1, x_2) = x_1^2 + x_2^3$

Determinare $f(A)$

Quiz (611)

1. Siano $f, g : [-1, 1] \to \mathbb{R}$ $\quad f(x) = e^{3x}$ $\quad g(x) = e^{-3x}$
   Qual è la distanza $d(f, g)$ in $\mathcal{B}([-1,1])$?

   a) $2 \sinh(3)$

   b) $\sinh(3)$

   c) $\sinh(2)$

   d) ndp

2. Sia $f \in C^1(\mathbb{R})$ $\quad g : \mathbb{R}^2 \to \mathbb{R}$ $\quad g(x_1, x_2) = \displaystyle\int_{3x_1}^{4x_2} f(t) \, dt$
   Allora

   a) $g(x_1, x_2) = -3 f(0) x_1 + 4 f(0) x_2 - \frac{9}{2} f'(0) x_1^2 + 8 f'(0) x_2^2 + o(x_1^2 + x_2^2) \quad (x_1, x_2) \to (0,0)$

   b) $g(x_1, x_2) = -3 f(0) x_1 + 4 f(0) x_2 - \frac{9}{2} f'(0) x_1^2 + 16 f'(0) x_2^2 + o(x_1^2 + x_2^2) \quad (x_1, x_2) \to (0,0)$

   c) $g(x_1, x_2) = -3 f(0) x_1 + 4 f(0) x_2 - 9 f'(0) x_1^2 + 16 f'(0) x_2^2 + o(x_1^2 + x_2^2) \quad (x_1, x_2) \to (0,0)$

   d) ndp

3. Sia $A = \{(x_1, x_2) \in \mathbb{R}^2 \mid (x_1 + x_2)(4x_1 + \beta x_2 + 1) = 0\}$. A è connesso per archi

   a) se e solo se $\beta \neq 4$

   b) se e solo se $\beta = 4$

   c) per qualsiasi valore di β

   d) ndp

4. Sia $A = \{(x_1, x_2) \in \mathbb{R}^2 \mid (x_1 - 1)^2 + 4x_2^2 \leq 1\}$ $f \in C^1(A)$. Allora $\displaystyle\int_A^- D_1 f(x) \, dx =$

   a) $\displaystyle\int_0^{2\pi} f\left(1 + \cos(t), \tfrac{1}{2} \sin(t)\right) \cos(t) \, dt$

   b) $\displaystyle\int_0^{2\pi} f\left(1 + \cos(t), \tfrac{1}{2} \sin(t)\right) \sin(t) \, dt$

   c) $\tfrac{1}{2} \displaystyle\int_0^{2\pi} f\left(1 + \cos(t), \tfrac{1}{2} \sin(t)\right) \cos(t) \, dt$

   d) ndp