ασκήσεις

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άσκηση 1 - διαφορικές εξισώσεις

$$\mu(x) = e^{\int \tan x\, dx} = \frac{1}{\cos x}$$

πολλαπλασιάζουμε:

$$\frac{d}{dx}\left(\frac{y}{\cos x}\right) = tanx \Rightarrow \frac{y}{\cos x} = \int \tan x\, dx = -\ln|\cos x| + c$$

$$\frac{x^2}{(x+1)^3} = \frac{A}{x+1} + \cdots + \frac{C}{(x+1)^3} \tag{1}$$

με βάση την εξίσωση 1:

$$\begin{cases} A = 1 \\ 2A + B = 0 \Rightarrow 2 + B = 0 \Rightarrow B = -2 \\ A + B + C = 0 \Rightarrow 1 - 2 + C = 0 \Rightarrow C = 1 \end{cases} \tag{2}$$

$$A(x+1)^2 = A(x^2 + 2x + 1) = Ax^2 + 2A + A \tag{3}$$

$$B(x+1) = Bx + B \tag{4}$$

$$\Rightarrow x^2 = Ax^2 + (2A + B)x + (A + B + C)$$

$$\lim_{x\to 0} \frac{e^x - \cos x - x\sin x - 1}{x^4}$$

$$\int_{a=1}^{n}$$

$$f(x) = \begin{cases} x^2 & x \in \mathbb{N} \\ 0 & x \in \mathbb{R} - \mathbb{N} \end{cases}$$