

# Ασκήσεις

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## Άσκηση 1 - Διαφορικές Εξιώσεις

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

Πολλαπλασιάζουμε:

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

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

Με βάση την εξίσωση 1.

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

$$\begin{aligned} A(x+1)^2 &= A(x^2 + 2x + 1) = Ax^2 + 2Ax + A \\ B(x+1) &= Bx + B \\ \Rightarrow x^2 &= Ax^2 + (2A + B)x + (A + B + C) \end{aligned} \quad (3)$$

$$\lim_{x \rightarrow 0} \frac{e^x - \cos x - x \sin x - 1}{x^4}$$
$$\int_{a=1}^n$$