Κεφάλαιο Δυναμοσειρές

Άσκηση 1

i. $f(x) = x + \frac{x^3}{3}$

ii. $f(x) = x + x^2 + \frac{x^3}{2} + \frac{x^4}{6}$

iii. $f(x) = x + \frac{x^2}{2} + \frac{5x^4}{24}$

iv. $f(x) = \ln(3) + \frac{2x}{3} - \frac{2x^2}{9} + \frac{8x^3}{81} - \frac{4x^4}{81}$

Άσκηση 2

i. $f(x) = 1 - x + x^2 - x^3 + x^4$

ii. $f(x) = 1 - \frac{x^2}{8} + \frac{x^4}{384}$

iii. $f(x) = 1 + \frac{x^2}{2} + \frac{x^4}{24}$

Άσκηση 3

i. $f(x) = -1 - (x+1) - (x+1)^2 - (x+1)^3 - (x+1)^4$

ii. $f(x) = (x+1) - \frac{(x+1)^2}{2} + \frac{(x+1)^3}{3} - \frac{(x+1)^4}{4}$

iii. $f(x) = \frac{15}{8} + \frac{17(x-\ln(4))}{8} + \frac{15(x-\ln(4))^2}{16} + \frac{17(x-\ln(4))^3}{48} + \frac{5(x-\ln(4))^4}{64}$

Άσκηση 4

i. $f(x) = x - x^2 + \frac{x^3}{2} - \frac{x^4}{6} + \frac{x^5}{24} + \cdots$

ii. $f(x) = x^2 - \frac{x^4}{2} + \frac{x^6}{24} - \frac{x^8}{720} + \cdots$

iii. $f(x) = x^2 - \frac{x^4}{3} + \frac{2x^6}{45} - \cdots$

iv. $f(x) = -x^2 - \frac{x^4}{2} + \frac{x^6}{3} - \cdots$

Άσκηση 5

i. $f(x) = \sin(x)\, e^{-x} = x - x^2 + \frac{x^3}{3} - \frac{x^5}{30} + \cdots$

Άσκηση 6

i. $f(x) = \ln\left(\frac{1+x}{1-x}\right) = 2x + \frac{2x^3}{3} + \frac{2x^5}{5} + \cdots$