• Să se calculeze diferența divizată cu noduri duble

$$\left[x_0^{(2)}, x_1^{(2)}, \dots, x_m^{(2)} \;;\; \frac{1}{x+a}\right]$$

REZOLVARE

Vom folosi relația

$$\left[x_0, x_1, \dots, x_m \;;\; \frac{1}{ax+b}\right] = \frac{(-1)^m a^m}{\prod_{i=0}^{m}(ax_i+b)}$$

$$\left[x_0^{(2)}, x_1^{(2)}, \dots, x_m^{(2)} \;;\; \frac{1}{x+a}\right] = \left[x_0, x_0, x_1, x_1, \dots, x_m, x_m \;;\; \frac{1}{x+a}\right]$$

$$= \left[x_0, x_0+\varepsilon, x_1, x_1+\varepsilon, \dots, x_m, x_m+\varepsilon \;;\; \frac{1}{x+a}\right]$$

$$= \frac{(-1)^{2m+1}\, 1^{2m+1}}{(x_0+a)(x_0+\varepsilon+a)\dots(x_m+a)(x_m+\varepsilon+a)}$$

Considerând $\varepsilon \to 0$ obținem:

$$\left[x_0^{(2)}, x_1^{(2)}, \dots, x_m^{(2)} \;;\; \frac{1}{x+a}\right] = \frac{-1}{(x_0+a)^2(x_1+a)^2\dots(x_m+a)^2}$$