$f(x) = x^4 + 2x^3 + x + 1$ ، $f(4)$ ، $f'(4)$ را بیابید.

$f'(x) = 4x^3 + 12x - 2x$

$b_4 = a_4 = 4$

$b_3 = a_3 + b_4 x_0 = 4 + 4 = 8$

$b_2 = a_2 + b_3 x_0 = 12 + 8 = 20$

$b_1 = a_1 + b_2 x_0 = 2 + 20 = 22$

$b_0 = a_0 + b_1 x_0 = 1 + 22 = 23$

$f(4) = 23$

$f'(4) = 4 \times 4^3 + 12 \times 4 - 2 \times 4 = 256 + 48 - 8 = 296$

$x_0 = -1$

$x_1 = 0$

False position $|f(x_n)| < 0.05$?

$g(x) = x^4 + 2x^3 - 12x - 12$

$g(x_0) \times g(x_1) < 0$ ⟵ ریشه در

$g(x_0) = 1 - 2 + 12 - 12 = -1$

$g(x_1) = 0 + 0 - 0 - 12 = -12$

$x_2 = x_1 - \left[\frac{x_1 - x_0}{g_1 - g_0}\right] g_1 = 0 - \left[\frac{0 + 1}{-12 - (-1)}\right] (-12) = \frac{-12}{-11} = 1.09$

$g(x_2) = 1.09^4 + 2(1.09)^3 - 12(1.09) - 12 = -0.24$

$x_3 = x_2 - \left[\frac{x_2 - x_1}{g_2 - g_1}\right] g_2 = 1.09 - \left[\frac{1.09 - 0}{-0.24 - (-12)}\right] (-0.24) = 1.09 - \left[\frac{1.09}{11.76}\right] (-0.24) = 1.09 + 0.02 = 1.11$

$g(x_3) = 1.11^4 + 2(1.11)^3 - 12(1.11) - 12 = 0.01$

$x_4 = x_3 - \left[\frac{x_3 - x_2}{g_3 - g_2}\right] g_3 = 1.11 - \left[\frac{1.11 - 1.09}{0.01 - (-0.24)}\right] (0.01) = 1.11 - \left[\frac{0.02}{0.25}\right] (0.01) = 1.11 - 0.0008 = 1.1092$