

Determine at least one of the roots of the given nonlinear equation by selected method. The solution includes:

- the mathematical description of the method used
- the composition of the own program for the solution of the given task (numeric and symbolic solution) including specification of the function in the form of a special function subprogram
- in the case of the solution of the algebraic equation complete the solution using the functions ROOTS a POLY
- the graphical illustration of the given function and eventually also the distribution of roots in the complex plane
- the checking of the solution substituting evaluated values to the given equation

Solving this task you can use some of the following functions ROOTS, POLY, PLOT, POLAR, ABS, ANGLE, FZERO and also SOLVE, EZPLOT.

M2.1	$x^3 - x - 1 = 0$	M2.21	$\sin x - 0.5 = 0$
M2.2	$x^3 + x - 3 = 0$	M2.22	$x - \tan x = 0$
M2.3	$x^3 - 3x^2 + 4 = 0$	M2.23	$e^{-x} - \cos x = 0$
M2.4	$x^3 + 2x - 1 = 0$	M2.24	$x^2 - \tan x = 2$
M2.5	$x^3 + 2x^2 - 5 = 0$	M2.25	$1.5x - \tan x = 0.1$
M2.6	$x^5 - 3x^2 + x^2 - 1 = 0$	M2.26	$4 \cos x - e^x = 0$
M2.7	$x^4 + 2.8x^3 - 0.38x^2 - 6.3x - 4.2 = 0$	M2.27	$e^{-x^2} - \cos x = 0$
M2.8	$x^4 - 7x^3 + 18x^2 - 20x + 8 = 0$	M2.28	$\sin x - 0.1x = 0$
M2.9	$x^7 - 1 = 0$	M2.29	$2 \cos x + 0.05x = 0$
M2.10	$x^6 + 2x^5 = x^4 + 3x^3 + 5x^2 + x + 1 = 0$	M2.30	$\sin x^2 - 0.5 = 0$
M2.11	$x^3 - 3x^2 + 2x - 6 = 0$	M2.31	$x - 2 \sin x = 0$
M2.12	$x^3 - 3x^2 + 3x - 9 = 0$	M2.32	$e^{-x} + 0.1x = 0$

Carry out numerical and symbolic solution of the given system of the nonlinear equations with graphical illustration of their solution and further determine the sequence of values of iterative solution using the Newton method. Present also the mathematical description of the used method and the commented algorithm of the solution.

M2.41	$f_1(x, y) = x^2 - y - 0.2$ $f_2(x, y) = y^2 - x - 0.3$	initial approximation: (1.2, 1.2), (-0.2, -0.2)
M2.42	$f_1(x, y) = x^2 + y^2 - 2$ $f_2(x, y) = x^2 - y - 0.5x + 0.1$	initial approximation: (1.2, 0.8), (-0.8, 1.2)
M2.43	$f_1(x, y) = x^2 + y^2 - 2$ $f_2(x, y) = xy - 1$	initial approximation: (1.1, 1.1), (-1.1, -1.1)
M2.44	$f_1(x, y) = 2xy - 3$ $f_2(x, y) = x^2 - y - 2$	initial approximation: (1.5, 0.9)
M2.45	$f_1(x, y) = x^2 + 4y^2 - 4$ $f_2(x, y) = x^2 - 2x - y + 1$	initial approximation: (1.5, 0.5), (-0.25, 1.1)
M2.46	$f_1(x, y) = 3x^2 - 2y^2 - 1$ $f_2(x, y) = x^2 - 2x + y^2 + 2y - 8$	initial approximation: (-1, 1), (3, -3.4)
M2.47	$f_1(x, y) = -x + y^2 - 2$ $f_2(x, y) = x^3 - 3x^2 + 4x - y$	initial approximation: 0.5, 1.2), (-0.25, -1.3)
M2.48	$f_1(x, y) = 2x^3 - 12x - y - 1$ $f_2(x, y) = 3y^2 - 6y - x - 3$	initial approximation: (2.5, 2.5), (0, 0), (-2.5, 0), (2.5, -1), (-2.5, 2.5), (0, 2.5)
M2.49	$f_1(x, y) = 3x^2 - 2y^2 - 1$ $f_2(x, y) = x^2 - 2x + 2y - 8$	initial approximation: (2.5, 3.0), (5.6, -7), (-1.6, 1.6), (-3.0, 3.6)
M2.50	$f_1(x, y) = 7x^3 - 10x - y - 1$ $f_2(x, y) = 8y^3 - 11y + x - 1$	initial approximation: (0, 0), (1, 0), (0, 1), (-1, 0), (0, -1), (1, 1), (-1, 1), (1, -1), (-1, -1)
