NMA – homework from week **8**

Consider Dirichlet problem for Poisson equation

$$-\Delta\, u(x,y) = 2x + y^2 \quad \text{on } \Omega\,, \qquad u(x,y) = y \quad \text{on } \partial\,\Omega\,,$$

where Ω is a quadrilateral domain given by its vertices
[-1 ; 0], [0.75 ; 0], [0 ; 1.5], [-1 ; 1.5].

a) Sketch the domain Ω and a mesh with step-size $h = 0.5$ with [0 ; 1] being one of the nodes of the mesh. Mark regular and non-regular nodes of the mesh.

b) Use finite difference scheme and assemble the system of discretized equations (use linear interpolation for non-regular nodes).