3.4 Conforming finite element methods on non-conforming meshes

- In non-conforming meshes hanging nodes appear that will not carry basis functions.
- There is no one-to-one correspondence between shape functions and basis functions anymore. We have shape functions related to hanging nodes, but no basis functions.
- Shape functions have to represent globally continuous basis functions (hat functions for linear FEM).
- Integration routine will be again over shape functions to generate element matrices, only the contribution to basis functions, i.e. the $T$-matrices, differ. For example, consider a mesh of three cells with each three shape functions and a total of four global basis functions due to a hanging node (that is marked with $\circ$).

- Support of basis functions consists of more than the adjacent cells.