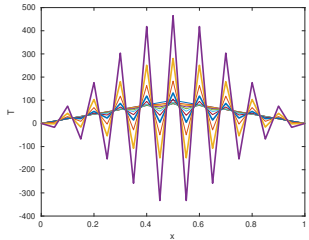
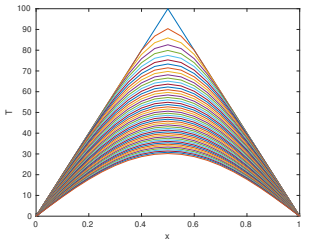
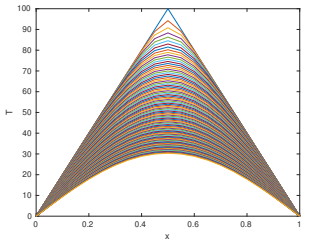
# MűFi23

## Parabolic PDEs - Finite Difference Solution

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- Derive the BTCS approximation of the one-dimensional unsteady heat diffusion problem

$$T_t = \alpha \cdot T_{xx}$$

- Solve the problem with boundary conditions $T(0) = 0$ and $T(L) = T_1$!

- Derive the Crank-Nicholson approximation for unsteady one-dimensional heat diffusion problem

$$T_t = \alpha \cdot T_{xx}$$

- Consider the unsteady two-dimensional diffusion equation

$$T_t = \alpha \cdot (T_{xx} + T_{yy})$$

  Derive the FTCS and BTCS schemes!
- Solve the problem on a rectangular region $r \in [0, W] \times [0, H]$. Boundary conditions are $T = 0$ on all sides, but $T(x, H) = 100$!