LECTURE 14

PARTIAL DIFFERENTIAL EQUATIONS *cont.*

Heat equation on the whole axis

- setting of the problem
- recall basic facts about Fourier transform
- solving the problem
  - making Fourier transform
  - solving the first order equation
  - returning to the original coordinates
- *Example* Initial temperature is a step function
- Comments about physics of the solution

Wave equation on the whole real axis. D'Alembert solutions

- Recall the wave equation
- Changing of variables and reducing to a mixed derivative - equation.
- Solving a new equation: d'Alambert solution of the wave equation
- Interpretation of the solution as moving waves
- Meeting the initial conditions:
- Special case: $u_t(x, 0) = 0$