

Partial Differential Equations - Homework Day 11

Professor:

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Read and Take Notes

1. *Farlow* - Lessons 11 and 12 on integral transforms.

Homework

1. *Problems* - Do all the problems at the end of Chapter 10
2. *Non-book problem* Solve the semi-infinite wave equation using a sine transform.

$$\begin{aligned}u_{tt} &= u_{xx} \\ 0 < x < \infty, \quad 0 < t < \infty \\ u(0, t) &= 0 \\ u(x, 0) &= e^{-x} \\ u_t(x, 0) &= 0\end{aligned}$$

Transform and solve, do not transform back just write your final solution as $u(x, t) = \mathcal{F}_s^{-1}[F]$ where you have solved for $F(\omega, t)$.

Other Notes:

1. Look carefully at the integral transform tables at the back of the book. It may even be helpful to look up some printable .pdf versions of integral transform tables!