Preliminary Examination: Partial Di□erential Equations,
10:00 AM - 1:00 PM, Jan. 14, 2013,
Rooms KOBL 350 and KOBL 355.

#	possible	score
1	25	
2	25	
3	25	
4	25	
5	25	
Total	100	

Name:_____

There are 5 problems. Do problems 1, 2 and 3, and choose one between problems 4 and 5. Each problem is worth 25 points. A sheet of convenient formulae is provided.

1. (a) State and prove the Riemann-Lebesgue Lemma.

   (b) Assume $f(x) : [-\pi,$

3. Let a curve be defined by $\gamma(\hat{x}) = \{(x, t) \quad \mathrm{R}^2 | t = -x \text{ and } x \leq \hat{x}\}$ and consider the partial differential equation for $u(x, t)$ with initial conditions on this curve:

$$\frac{\partial u}{\partial t} + t\frac{\partial u}{\partial x} = u, \qquad t \geq -x, \tag{4}$$
$$u(s, -s) = \sin(s), s, -s s$$