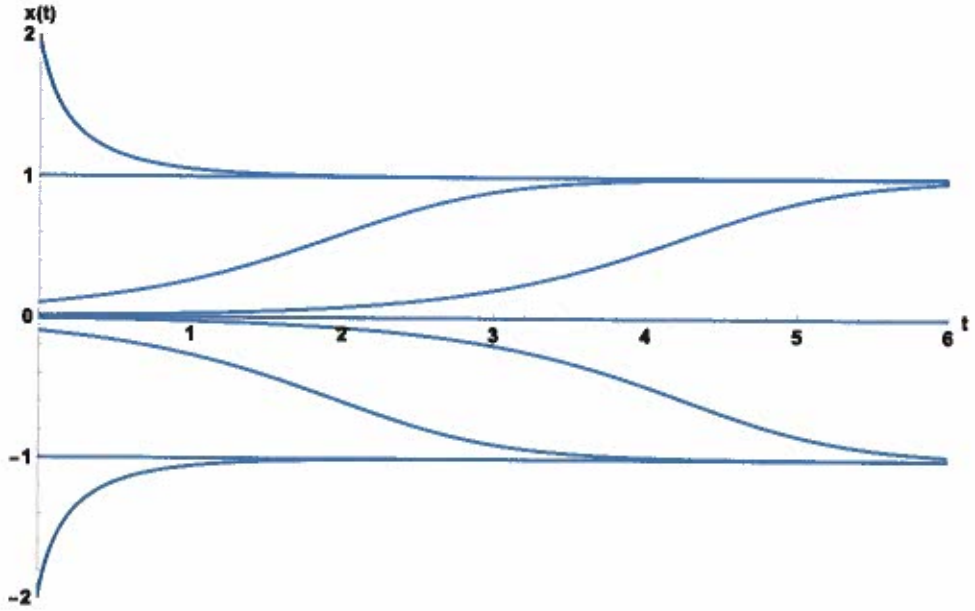
Key

MTH 352
Quiz #3

1. The figure below is a plot of the characteristic curves for the following initial value problem

$$u_t + c(x)u_x = 0$$
$$u(x,0) = e^{-x^2}.$$



If $u(x,t)$ is a solution to this PDE, compute

$$u^*(x) = \lim_{t\to\infty} u(x,t).$$

$$u^*(x) = \begin{cases} 0, & x<-1,\ x>1 \\ e^{-1}, & x=\pm 1 \\ 1, & -1<x<1 \end{cases}$$