

Quiz 9

1. $u_{xx} + u_{xt} + u_t = 0 \rightarrow X''T + X'T' + XT' = 0$
 $u(x,t) = X(x)T(t)$
 $u_{xx} = X''T$
 $u_{xt} = X'T'$
 $u_t = XT'$

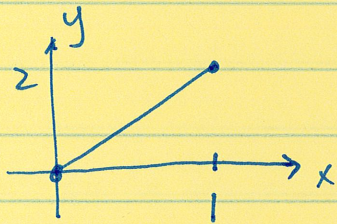
$$X''T + T'(X'+X) = 0$$

$$X''T = -T'(X'+X)$$

$$\frac{X''}{X'+X} = -\frac{T'}{T} = \lambda \quad (\text{or } -\lambda)$$

$$\begin{cases} X'' - \lambda(X'+X) = 0 \\ T' + \lambda T = 0 \end{cases}$$

2.



$$u_{\text{steady}} = 2x$$