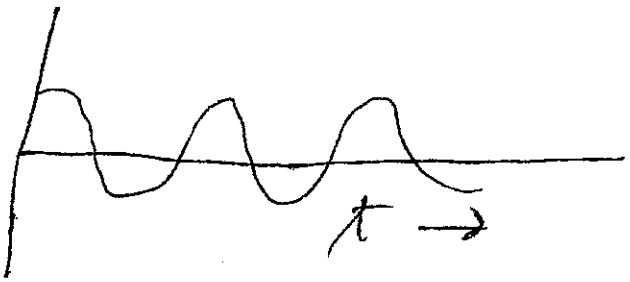
Assume $T \sim \exp j\omega t \exp -\gamma X$

$$j\omega T = K\gamma^2 T$$

$$\gamma^2 = j\omega/K$$

$$\gamma = \pm \frac{(1+j)}{\sqrt{2}} \left(\frac{\omega}{K}\right)^{1/2} = \alpha + j\beta$$

$$T = Re\left[T_0 \exp j\omega t \exp -\alpha X \exp -j\beta X\right]$$




AT $X = X_0$, The amplitude is reduced and there is a phase change.

Now assume That a rectangular temperature pulse is applied at $X = 0$;

how does it look at $X = X_0$

why does the pulse broaden

$\alpha \sim \sqrt{\omega}$

higher frequencies decay more rapidly with distance.