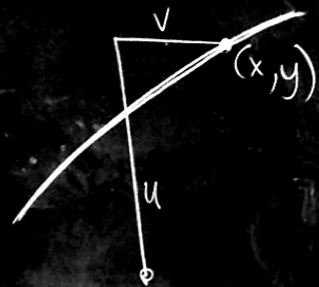


Wave Equation



Assume

(1) $y = u(x, t)$

(2) Ignore v

(3) Tension = constant = T_0

(4) perfectly flexible

(5) $\rho_0(x) = \text{mass density} = \rho_0$

$$u_{tt} = c^2 u_{xx}$$

+ shape
+ speed



$$\rho_0(x) u_{tt} = T_0 u_{xx} + Q(x, t) \rho_0(x)$$

$Q = -g$
usually

$$\rho_0 u_{tt} = T_0 u_{xx}, \quad Q = 0$$

$$u_{tt} = c^2 u_{xx}$$

$$\frac{T_0}{\rho_0} \equiv c^2, \quad c = \text{Wave Speed}$$