

Jon Allen  
HW 08

$$u(x, t) = \sum_{n=1}^{\infty} A_n e^{-(n\pi\alpha)^2 t} \sin(n\pi x)$$

$$u(x, 0) = \sum_{n=1}^{\infty} A_n \sin(n\pi x)$$

$$= \sin(2\pi x) + \frac{1}{3} \sin(4\pi x) + \frac{1}{5} \sin(6\pi x)$$

$$A_2 = 1$$

$$A_4 = \frac{1}{3}$$

$$A_6 = \frac{1}{5}$$

$$\text{all other } A_n = 0$$

$$u(x, t) = e^{-4(\pi\alpha)^2 t} \sin(2\pi x) + \frac{1}{3} e^{-16(\pi\alpha)^2 t} \sin(4\pi x) + \frac{1}{5} e^{-36(\pi\alpha)^2 t} \sin(6\pi x)$$