MÉTODO DE SEPARACION DE VARIABLES

EDenDP(2) $\qquad \dfrac{\partial^2 z}{\partial x^2} + 6\dfrac{\partial z}{\partial y} = z \qquad z(x,y)$

H_0: $\quad z(x,y) = P(x)Q(y)$

$$\frac{\partial z}{\partial x} = P'(x)\cdot Q(y) \qquad \frac{\partial^2 z}{\partial x^2} = P''(x)\cdot Q(y)$$

$$\frac{\partial z}{\partial y} = P(x)\cdot Q'(y)$$

$$P''(x)\cdot Q(y) + 6P(x)Q'(y) = P(x)\cdot Q(y)$$

$$P''(x)\cdot Q(y) = -6P(x)Q'(y) + P(x)Q(y)$$

$$P''(x)\cdot Q(y) = P(x)\left[-6Q'(y) + Q(y)\right]$$

$$\frac{P''(x)}{P(x)} = \frac{-6Q'(y) + Q(y)}{Q(y)}$$

EcuX $\Rightarrow \dfrac{P''(x)}{P(x)} = \alpha \qquad$ EcuY $= \dfrac{-6Q'(y) + Q(y)}{Q(y)} = \alpha$

$$P''(x)\cdot Q(y) - P(x)\cdot Q(y) = -6\,P(x)\,Q'(y)$$

$$\big(P''(x) - P(x)\big)\,Q(y) = -6\,P(x)\,Q'(y)$$

$$\frac{P''(x) - P(x)}{-6P(x)} = \frac{Q'(y)}{Q(y)}$$

$$\text{EcuaXX} = \frac{P''(x) - P(x)}{-6P(x)} = \alpha \qquad \text{EcuaYY} = \frac{Q'(y)}{Q(y)} = \alpha$$

$$\frac{\partial y(x,t)}{\partial x} + \frac{\partial^2 y(x,t)}{\partial x \partial t} - \frac{\partial y(x,t)}{\partial t} = 0$$

$$H_0 = P(x) \cdot Q(t)$$

$$\frac{\partial y}{\partial x} = P'(x) \cdot Q(t) \qquad \frac{\partial^2 y(x,t)}{\partial x \partial t} = P'(x) \cdot Q'(t)$$

$$\frac{\partial y}{\partial t} = P(x) \cdot Q'(t)$$

$$P'(x) \cdot Q(t) + P'(x) Q'(t) - P(x) \cdot Q'(t) = 0$$

$$P'(x) \cdot Q(t) + P'(x) Q'(t) = P(x) \cdot Q'(t)$$

$$P'(x) \left[Q(t) + Q'(t) \right] = P(x) \cdot Q'(t)$$

$$\frac{P'(x)}{P(x)} = \frac{Q'(t)}{Q(t) \cdot Q'(t)}$$

$$H_0 = P(x)\,Q(y)$$

$$H_1 = P(x) + Q(y)$$

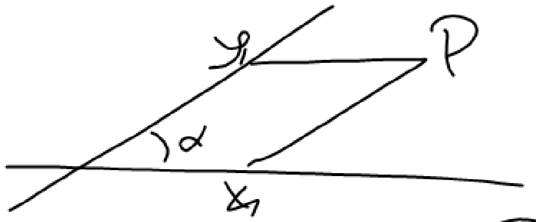
$$H_2 = P(x)^y$$

$$H_3 = Q(y)^x$$

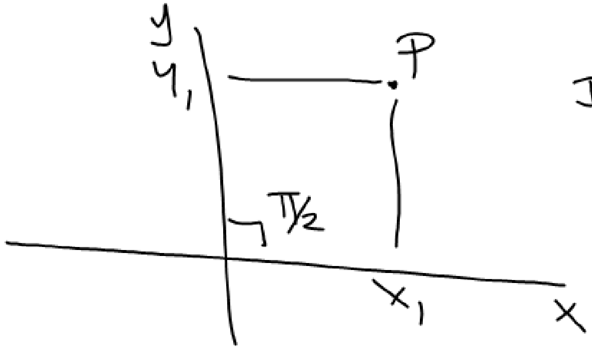
$$H_4 = P(x)\,L y$$

$$H_5 = Q(y)\,L x$$

$y(t) =$

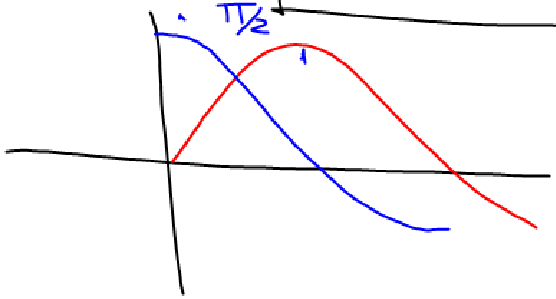


$P(x_1, y, \alpha)$



$P(x_1, y_1)$

sen(x)   cos(x)



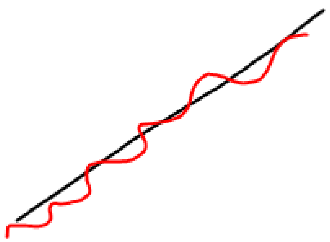
Serie Trigonométrica FOURIER

$$f(x) = \frac{a_0}{2} + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi}{L} x + b_n \operatorname{sen} \frac{n\pi}{L} x \right)$$

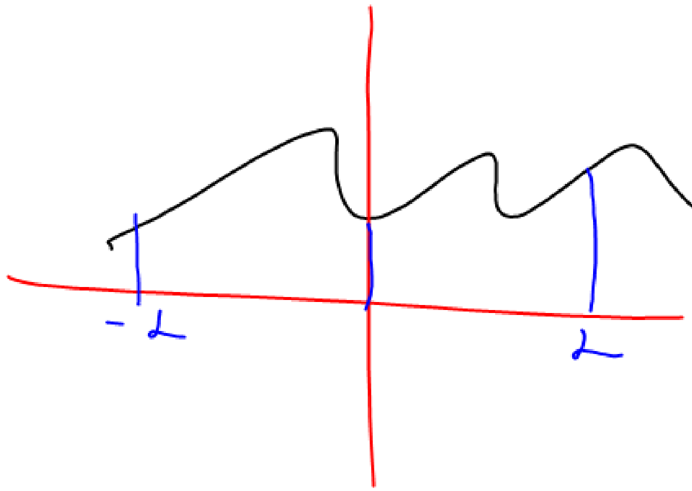
$$a_0 = \frac{1}{L} \int_{-L}^{L} f(x)\, dx$$

$$a_n = \frac{1}{L} \int_{-L}^{L} f(x) \cos\left(\frac{n\pi}{L} x\right) dx$$

$$b_n = \frac{1}{L} \int_{-L}^{L} f(x) \operatorname{sen}\left(\frac{n\pi}{L} x\right) dx.$$



$f(x)$


-2
2