

Compito 2

(*)

$$\begin{cases} \dot{x} = -ax + by \\ \dot{y} = ax - by \end{cases}$$

$$x(0) = y(0) = \frac{1}{2}$$

calcolare $x(t)$

(*)

$$\partial_t U = \partial_{xx}^2 U - \alpha U + \beta \sin 3x$$

$$\alpha > 0, \quad 0 < x < \pi, \quad U(0, t) = U(\pi, t) = 0$$

$$U(x, 0) = \sin x - \frac{1}{5} \sin 4x + \sin 3x$$

calcolare $U(x, t)$

(*)

Mostrare che

$$\sum_{n=1}^{\infty} \varphi_n^*(x) \varphi_n(x') = \delta(x - x')$$

ove $\varphi_n(x)$ sono un set ortonormale
e completo

verificante nel caso $-\pi < x < \pi$

$$\varphi_n(x) = \frac{1}{\sqrt{2\pi}} e^{i n x}$$

$$n = 0, \pm 1, \pm 2, \dots$$

$$\frac{1}{2\pi} \sum_{n=-\infty}^{\infty} e^{-i n (x - x')} = \delta(x - x')$$