$$\Delta < 0 \implies \lambda_{1,2} = \alpha \pm i\beta \ \ \& \ \ y_1 = e^{\alpha x} cos(\beta x), y_2 = e^{\alpha x} sin(\beta x)$$
$$f(t) = Ae^{\alpha t} \implies y_p(t) = ce^{\alpha t}$$
$$f(t) = \text{polinomio} \implies y_p(t) = At^2 + Bt + C$$
$$f(t) = \text{trigonometrico} \implies y_p(t) = Acos(vt) + Bsin(vt)$$
$$L(x, y, \lambda) = f(x, y) - \lambda \cdot g(x, y)$$
$$H_f = \begin{bmatrix} f_{xx} & f_{xy} \\ f_{yx} & f_{yy} \end{bmatrix}$$
$$\text{se } det(H_f) > 0 \text{ e } f_{xx} > 0 : \text{Minimo locale}$$
$$\text{se } det(H_f) > 0 \text{ e } f_{xx} < 0 : \text{Massimo locale}$$
$$\text{se } det(H_f) < 0 : \text{Punto di sella}$$
$$JT = \begin{bmatrix} g_u & g_v \\ h_u & h_v \end{bmatrix}$$
$$\text{Cambio di variabile: } \iint_D f(x, y)dxdy = \iint_S f(g(u, v), h(u, v))|det(JT)|dudv$$
$$rot\underline{F} = \begin{bmatrix} \underline{i} & \underline{j} & \underline{k} \\ \partial x & \partial y & \partial z \\ F_1 & F_2 & F_3 \end{bmatrix}$$
$$L = \int_\gamma \underline{F} \cdot d\underline{r} = \int_a^b \underline{F}(\underline{r}(t)) \cdot \underline{r}'(t)dt$$
$$\int_{\partial A^+} \underline{F} \cdot d\underline{r} = \iint_A rot(\underline{F})dxdy$$
$$\underline{n} = \frac{r_u \times r_v}{|r_u \times r_v|}$$
$$\nabla f = \begin{bmatrix} \pm f_x \\ \pm f_y \\ \mp 1 \end{bmatrix}$$
$$dS = \sqrt{1 + ||\nabla f||^2} dxdy$$
$$n \cdot dS = \nabla f dxdy$$
$$\phi(\underline{F}, S) = \iint_S \underline{F} \cdot \underline{n} dS$$
$$div\underline{F} = \frac{\partial F_1}{\partial x}\underline{i} + \frac{\partial F_2}{\partial y}\underline{j} + \frac{\partial F_3}{\partial z}\underline{k}$$
$$\iint_{\partial D^+} \underline{F} \cdot \underline{n} dS = \iiint_D div\underline{F} dxdydz$$
$$A(D) = \frac{1}{2}\int_{\partial^+ D} xdy - ydx = \frac{1}{2}\int_{\partial^+ D} \underline{\mathrm{F}} \cdot \mathrm{d}\underline{\mathrm{r}}$$
$$U(x, y) = \int_{y_o}^{y} F_2(x_o, t)dt + \int_{x_o}^{x} F_1(t, y)dt$$