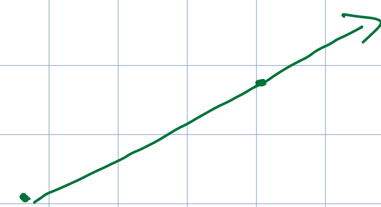
29/1/19 (6) Pto a eq. della retta ℓ per $\begin{pmatrix}2\\1\\-3\end{pmatrix}$ $\begin{pmatrix}5\\4\\1\end{pmatrix}$

$$\ell = \underbrace{\begin{pmatrix}2\\1\\-3\end{pmatrix}} + \mathrm{Span}\Bigg(\underbrace{\begin{pmatrix}5\\4\\1\end{pmatrix} - \begin{pmatrix}2\\1\\-3\end{pmatrix}}\Bigg)$$

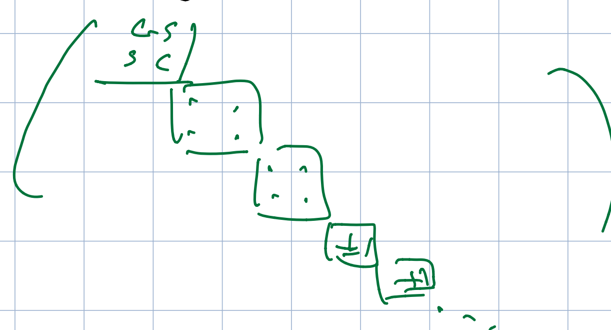
$$\begin{pmatrix}3\\3\\4\end{pmatrix}$$



$[3 : 3 : 4]$

4/6/19 (2) $A \in M_{2\times 2}(\mathbb{R})$ ortog., autoval -1; diagon?

Ortog: coniugata



$$\begin{pmatrix}\pm 1 & \\ & -1\end{pmatrix}$$

Sì

9/1/18 (1) $p_A(t) = (t-3)^2(t+5)$ ha autoval -2? **No**

(3) $v \perp \begin{pmatrix}2+i\\3i\end{pmatrix}$, unitari $v_1 + v_2 \in i\cdot\mathbb{R}$.

$$\left\langle \begin{pmatrix} z \\ i-z \end{pmatrix} \middle| \begin{pmatrix} 2+i \\ 3i \end{pmatrix} \right\rangle = z(2-i) + (i-z)(-3i)$$

$$= z(2+2i) + 3$$

$$z = -\frac{3}{2+2i} = -\frac{1}{2} \cdot \frac{3(1-i)}{2}$$

$$= -\frac{3}{4}(1-i)$$

$$v = \pm \frac{1}{\dots} \begin{pmatrix} 3(1-i) \\ 4i-3(1-i) \end{pmatrix} = \pm \frac{1}{\sqrt{\dots}} \begin{pmatrix} 3(1-i) \\ -3+i \end{pmatrix}$$

18/1/20 ④ $\underline{-3x^2} \underline{-8xy} \underline{+6xz} \underline{+3y^2} \underline{-2yz} \underline{-4y} \underline{+2z} = 0$

$$\begin{pmatrix} -3 & -4 & 3 & 0 \\ -4 & 3 & -1 & -2 \\ 3 & -1 & 0 & 1 \\ 0 & -2 & 1 & 0 \end{pmatrix}$$

$d_2 < 0$

$d_3 = +12 + 12 - 27 + 3 = 0$

$d_4 = \dots \neq 0 \implies$ parab. ipub.

⑥ $\alpha(t) = \begin{pmatrix} 3t - t^2 \\ t + 2t^2 \end{pmatrix}$ $t \in [0,1]$ $\int_\alpha \left(2x + y - \frac{7}{10}\right)$

$$\int_0^1 \left(6t - 2t^2 + t + 2t^2 - \frac{7}{10}\right) \cdot \sqrt{(3-2t)^2 + (1+4t)^2}\, dt$$

$$= \int_0^1 \left(7t - \frac{7}{10}\right) \sqrt{9 - 12t + 4t^2 + 1 + 8t + 16t^2}$$

$$= \frac{7}{10} \int_0^1 (10t - 1) \sqrt{20t^2 - 4t + 10} \; dt$$

$$= \frac{7}{10} \cdot \frac{1}{4} \cdot \frac{2}{3} \left(20t^2 - 4t + 10\right)^{3/2} \Big|_0^1 = \dots$$

(7) $$\int_{\partial D^2} \underbrace{(2y - e^{x^2})dx + (x + \ln(1+y^2))dy}_{\omega}$$

$$= \int_{D^2} d\omega = \int_{D^2} 2\, dy\, dx + dx\, dy = \int_{D^2} -dx\, dy = -\pi$$

28/1/20 (4) $$\begin{pmatrix} -i & 2-i \\ -2-i & 3i \end{pmatrix}$$ antihermitiana

$$\lambda_1 + \lambda_2 = 2i$$
$$\lambda_1 \cdot \lambda_2 = 3 + 4 + 1 = 8$$
$$\lambda_1 = 4i \qquad \lambda_2 = -2i$$

V_1: $\quad -i \cdot x + (2-i)y = 4ix \qquad \begin{pmatrix} 2-i \\ 5i \end{pmatrix}$

V_2: $\quad -ix + (2-i)y = -2i \qquad \begin{pmatrix} 2-i \\ -i \end{pmatrix}$

16/2/21 ④ $\langle p | q \rangle = \int_0^1 p \cdot q$ $\qquad R_{\leq 1}[t]$

$p(t) = a + b \cdot t$

$$\int_0^1 (a+bt)\cdot(3-2t) = \int_0^1 3a + (3b-2a)t - 2bt^2$$

$$= 3a + \frac{3b-2a}{2} - \frac{2b}{3}$$

$$18a + 9b - 6a - 4b = 0$$

$$12a + 5b = 0$$

$$p = \frac{1}{\|5-12t\|}(5-12t)$$

$$\|5-12t\|^2 = \int_0^1 (5-12t)^2 = \dots$$

⑥

$$\begin{pmatrix} 3t-2 & t & 1 \\ t & t-1 & 0 \\ 1 & 0 & -1/2 \end{pmatrix}$$