CURVE

Disegnare il sostegno delle seguenti curve:

(1) $\varphi(t) : \begin{cases} \varphi_1(t) = 3 - t \\ \varphi_2(t) = 4 - 3t \end{cases}$ $t \in [0,1]$

(2) $\gamma(t) : \begin{cases} \gamma_1(t) = \cos^2 t \\ \gamma_2(t) = \text{sen}^2 t \end{cases}$ $t \in [0,2\pi]$

(3) $\xi(t) : \begin{cases} \xi_1(t) = 4 \cos t \\ \xi_2(t) = 9 \text{ sen } t \end{cases}$ $t \in [0,2\pi]$

(4) $\sigma(t) : \begin{cases} \sigma_1(t) = t \\ \sigma_2(t) = 2 - t \\ \sigma_3(t) = t \end{cases}$ $t \in [0,1]$

(5) $\rho(t) : \begin{cases} \rho_1(t) = 1/\sqrt{2} \cos t \\ \rho_2(t) = 1/\sqrt{2} \cos t \\ \rho_3(t) = \text{sen } t \end{cases}$ $t \in [0,\pi/4]$

Per ciascuno dei seguenti sottoinsiemi di $\mathbb{R}^2$ o di $\mathbb{R}^3$ determinare una delle curve di cui è il sostegno.

(6) $\{ (x,y) : y = 2x + 1 \ , \ x \geq 0 \}$

(7) $\{ (x,y) : y = x + 1 \ , \ y = -x + 1 \ , \ y \geq 0 \}$

(8) $\{ (x,y,z) : y = x^2 \ , \ z = 2y \}$

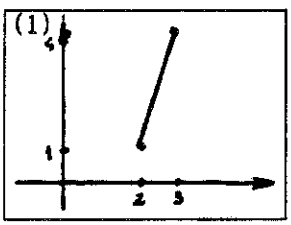
Calcolare la lunghezza delle seguenti curve:

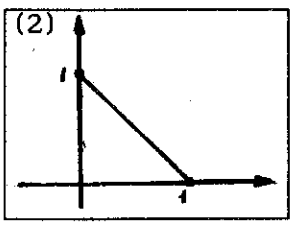
(9) $X(t) : \begin{cases} x_1(t) = \cos^3 t \\ x_2(t) = \text{sen}^3 t \end{cases}$ $t \in [0,\pi/2]$

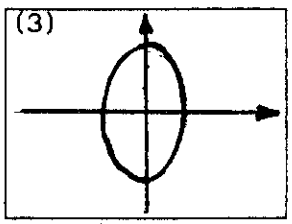
(10) $Y(t): \begin{cases} y_1(t) = e^t \\ y_2(t) = e^{-t} \\ y_3(t) = 2\,|t| \end{cases}$ $t \in [-1,1]$

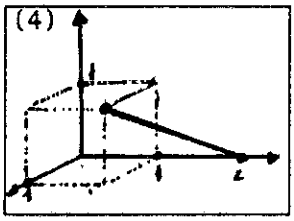
(11) $Z(t): \begin{cases} z_1(t) = \cos t \\ z_2(t) = \operatorname{sen} t \\ z_3(t) = |t|^{3/2} \end{cases}$ $t \in [-1,1]$

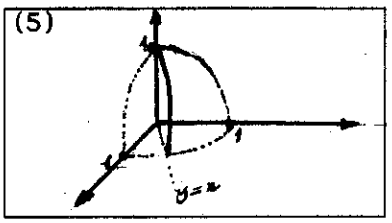
RISPOSTE.











(6) $\begin{cases} x_1(t) = 1 - t \\ x_2(t) = 3 - 2t \end{cases}$ $t \le 1$

(7) $Z(t): \begin{cases} X(t) & t \in [0,1] \\ Y(t) & t \in [1,2] \end{cases}$ dove: $X(t): \begin{cases} x_1(t) = t-1 \\ x_2(t) = t \end{cases}$, $Y(t): \begin{cases} y_1(t) = 1-t \\ y_2(t) = 2-t \end{cases}$

(8) $\begin{cases} \lambda_1(t) = t \\ \lambda_2(t) = t^2 \\ \lambda_3(t) = 2t \end{cases}$ $t \in \mathbb{R}$; (9) 3/4 ; (10) $2/e\,(e^2 - 1)$; (11) 8/9