1. A) Vectorial b) vectorial c) vectorial d) escalar

2. a. $Dom(F) = \{(x, y) \in R^2/4 - x^2 - y^2 \geq 0\}$
b. $Dom(F) = \{(x, y) \in R^2/8 - (2x + 3y) > 0\}$
c. $Dom(F) = R^2$
d. $Dom(F) = \{(x, y) \in R^2/x + 2y > 0,\ x^2 + y^2 - 36 \geq 0\}$
e. $Dom(F) = \{(x, y) \in R^2/9 - y^2 \geq 0,\ 2x + y \neq 0\}$
f. $Dom(F) = \{(x, y) \in R^2/1 - x^2 \neq 0,\ y^2 - 4 \neq 0\}$

3. a. No b. No c. Si

5. a.$C_{-1} = \{(x, y) \in Dom(F)/x - 3y = -1\}$, $C_0 = \{(x, y) \in Dom(F)/x - 3y = 0\}$,
$C_1 = \{(x, y) \in Dom(F)/x - 3y = 1\}$

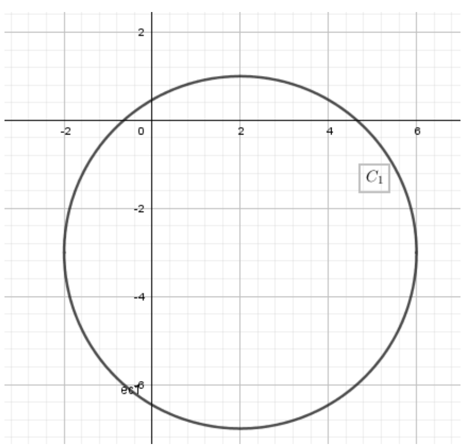
b. $C_{-1} = \left\{(x, y) \in Dom(F)/\frac{2}{x-y} = -1\right\}$, $C_0 = \emptyset$, $C_{-1} = \left\{(x, y) \in Dom(F)/\frac{2}{x-y} = 1\right\}$

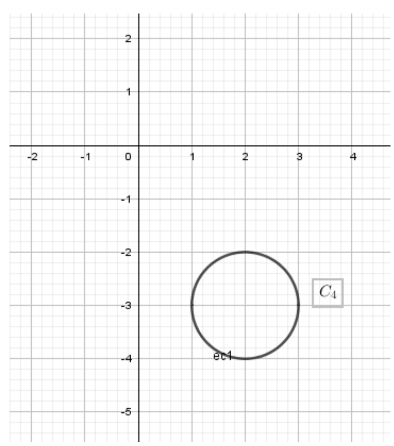
c. $C_{-1} = \left\{(x, y) \in Dom(F)/\frac{y}{x^2-1} = -1\right\}$, $C_0 = \left\{(x, y) \in Dom(F)/\frac{y}{x^2-1} = 0\right\}$
$C_1 = \left\{(x, y) \in Dom(F)/\frac{y}{x^2-1} = 1\right\}$

d. $C_{-1} = \emptyset$, $C_0 = \left\{(x, y) \in Dom(F)/\sqrt{25 - x^2 - y^2} = 0\right\}$, $C_1 = \left\{(x, y) \in Dom(F)/\sqrt{25 - x^2 - y^2} = 1\right\}$

6. $F: R^2 \to R/F(x, y) = y - x^2 + 5$

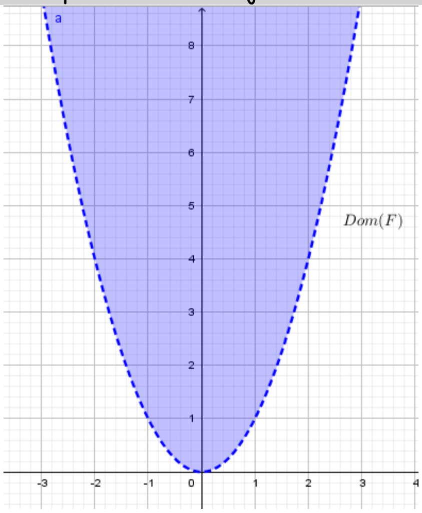
7. $C_1 = \left\{(x, y) \in Dom(V)\Big/\frac{4}{\sqrt{(x-2)^2+(y+3)^2}} = 1\right\}$, $C_4 = \left\{(x, y) \in Dom(V)\Big/\frac{4}{\sqrt{(x-2)^2+(y+3)^2}} = 4\right\}$

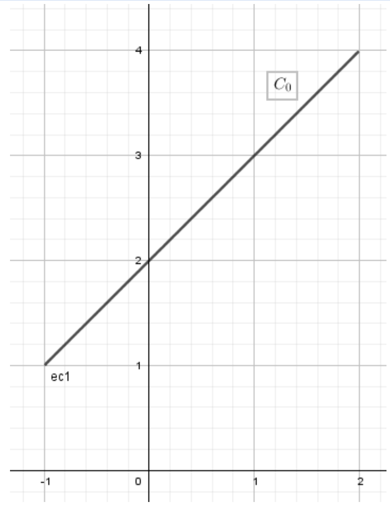




8. x = t, y = - t + 5, t ϵ R

9.
a. $Dom(F) = \{(x, y) \in R^2/y - x^2 > 0\}$ b. $C_0 = \left\{(x, y) \in Dom(F)/\frac{y-x-2}{\sqrt{y-x^2}} = 0\right\}$





10.

a. $C_4 = \{(x,y,z) \in R^3 / x^2 + y^2 + z^2 = 4\}$ Esfera de radio 4 y centro (0,0,0)
b. $C_1 = \{(x,y,z) \in R^3 / x + y + z = 1\}$ Plano
c. $C_0 = \{(x,y,z) \in R^3 / z + x^2 + y^2 = 0\}$ Paraboloide circular

11. $a. Dom(v) = R^2$ $b. Dom(\bar{v}) = \{(x,y) \in R^2 / x \neq 0, y \neq 0\}$ $c. Dom(v) = R^3$

12.

a. i. $z = x^2 + y^2$ (paraboloide circular)
ii. $z = x^2 + y^2, \quad z \leq 1$
b. $z = 1 - x - y$ (plano)
c. $x^2 + y^2 + z^2 = 1$ (esfera de radio 1 y centro (0,0,0))
d. i. $x^2 + y^2 = 1$ (cilindro circular)
ii. $x^2 + y^2 = 1, \;\; 0 \leq y \leq 1, -1 \leq x \leq 1, 1 \leq z \leq 2$
e. $z = (x-1)^2 + 2y^2$ (paraboloide elíptico)
f. $z^2 = x^2 + y^2$ (cono circular)

13.

a. $\bar{F}: R^2 \to R^3 / \bar{F}(u,v) = (u; v; -2u + v + 3)$
b. $\bar{F}: R^2 \to R^3 / \bar{F}(u,v) = (u; v; u^2 + v^2)$
c. $\bar{F}: R^2 \to R^3 / \bar{F}(u,v) = \left(u; v; \sqrt{u^2 + v^2}\right)$
d. $\bar{F}: R^2 \to R^3 / \bar{F}(u,v) = (3\cos(u); 3sen(u); v)$
e. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = (2\cos(u) sen(v); 2sen(u) sen(v); 2\cos(v))$
f. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = (3\cos(u); 3sen(u); v)$

$D = \left\{(u,v) \in R^2 / 0 \leq u \leq \frac{\pi}{2}, v \geq 0\right\}$

g. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = (u; v; 4 - u - v)$

$D = \{(u,v) \in R^2 / u > 0, v > 0, u + v < 4, u^2 + v^2 < 4\}$

h. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = (2\cos(u); 2sen(u); v)$

$D = \left\{(u,v) \in R^2 / 0 < u < \frac{\pi}{2}, v > 0, 2cos(u) + 2\mathrm{sen}(u) + v < 4\right\}$

i. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = (u; v; 4 - u^2 - v^2)$
$D = \{(u,v) \in R^2 / u^2 + v^2 < 4\}$

j. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = (v\cos(u); v sen(u); v^2)$
$D = \{(u,v) \in R^2 / 0 \le u \le 2\pi, 1 < v < 3\}$

k. $\bar{F}: D \subseteq R^2 \to R^3 / \bar{F}(u,v) = \left(\sqrt{2}\cos(u) sen(v); \sqrt{2} sen(u) sen(v); \sqrt{2}\cos(v)\right)$
$D = \left\{(u,v) \in R^2 / 0 \le u \le 2\pi, 0 \le v \le \frac{\pi}{4}\right\}$

14.

a. $\bar{F}: R^2 \to R^3 / \bar{F}(u,v) = (u; v; u^2 + v^2)$ una parametrización de la superficie S_1
$\bar{G}: R^2 \to R^3 / \bar{F}(u,v) = \left(u; v; 6 - \sqrt{u^2 + v^2}\right)$ una parametrización de la superficie S_2

b. $C = \{(x,y,z) / x = 2\cos(t), y = 2sen(t), z = 4, t \in [0,2\pi]\}$

c. (x,y,z)=(2,0,4)+k(0,2,0), k∈R