

$$C: \mathbb{R}$$

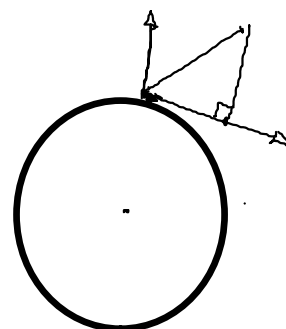
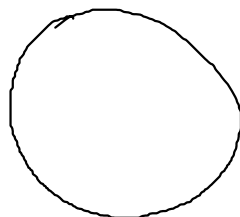
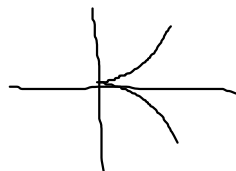
$$C: [0, 2\pi] \rightarrow \mathbb{R}^3$$

$$C(t) = (\cos(t), \sin(t), t)$$

$$f(x, y, z) = x^2 + y^2 + z^2$$

$$\int_C f \, ds = \int_0^{2\pi} f(C(t)) \|C'(t)\| \, dt$$

$$= \int_0^{2\pi} (1+t^2) \, dt$$



$$C'(t) = (-\sin(t), \cos(t), 1)$$

$$\|C'(t)\| = \sqrt{2}$$

$$F(x, y, z) = (x, y, z)$$

$$\int_C F \cdot dS = \int_0^{2\pi} F(C(t)) \cdot C'(t) \, dt = \int_0^{2\pi} t \, dt$$

Demostración: $C: I \rightarrow \mathbb{R}^n$, $P = C \circ h$ una reparametr.

$$P: I' \rightarrow \mathbb{R}^n$$

$$P' = C'(h) \cdot h'$$

$$\int_P F \cdot dS = \int_a^b F(P) \cdot C'(h) \cdot h' \, dt = \int_I F \cdot C' \, dt$$

Lemma, Si h preserva orientación $\Rightarrow h' > 0$

Demo: Ej mental