⑤ Calcolare π_1 di:

$A := \{ x \in \mathbb{R}^2 \mid \|x\| > 1 \}$

$B := \{ x \in \mathbb{R}^2 \mid \|x\| < 1 \}$

$C := \{ x \in \mathbb{R}^2 \mid \|x\| \geq 1 \}$

$D := \{ (x,y) \in \mathbb{R}^2 \mid y \geq x^2 \}$

$E := \{ (x,y) \in \mathbb{R}^2 \mid y \leq x^2 \}$

$F := \mathbb{S}^1 \cup (\mathbb{R}_+ \times \mathbb{R})$

$G := \mathbb{R}^2 \setminus (\mathbb{R}_+ \times \{0\})$

$\mathbb{R}_+ := \{ x \in \mathbb{R} \mid x \geq 0 \}$

$A, C \simeq \mathbb{S}^1 \Rightarrow \pi_1(A) = \pi_1(C) = \mathbb{Z}$

B, D, E, G convessi $\Rightarrow$ contraibili

$\Rightarrow$ semp/ conn

$\Rightarrow \pi_1(B) = \pi_1(D) = \pi_1(E) = \pi_1(G) = \{e\}$

$$\pi_1(F, x) = \begin{cases} \mathbb{Z}, & x \in \mathbb{S}^1 \\ \{e\}, & x \in (\mathbb{R}_+ \times \mathbb{R}) \end{cases}$$