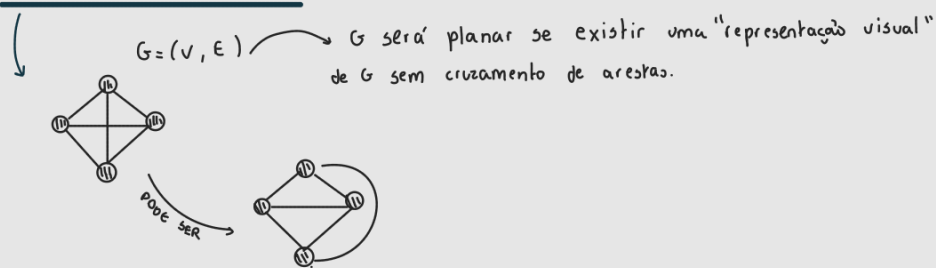
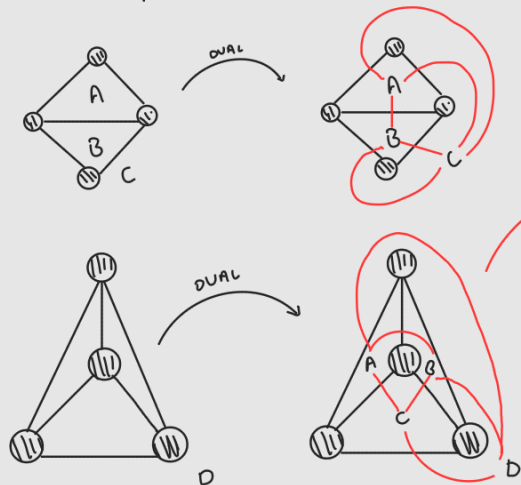


PLANARIDADE



GRAFO DUAL

→ cada face de G será 1 vértice em G dual



perguntar

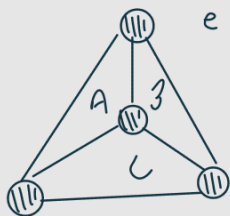
preciso juntar as faces de dentro com as de dentro ou apenas a de fora com as de dentro

exercícios

→ como identificar se um grafo é planar analisando o número de vértices e arestas?

$$v + e + f = 2$$

$$\begin{aligned} v &= 4 \\ e &= 6 \\ f &= 4 \end{aligned}$$



$$1 \text{ face} = 3 \text{ arestas}$$

$$n \text{ faces} = 3n$$

$$|E| = \frac{3 \cdot f}{2} \rightarrow 2 \cdot e = 3f$$

$$\text{Se } v - e + f = 2$$

$$\rightarrow v - e + \frac{2e}{3} = 2$$

$$3v - 3e + 2e = 6$$

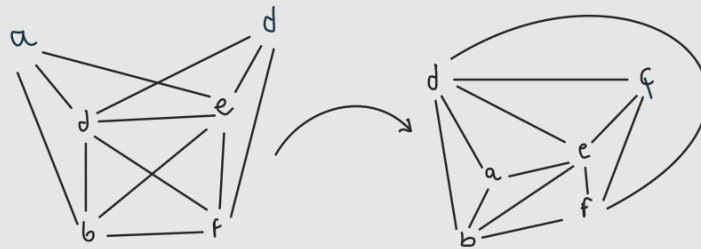
$$e \leq 3v - 6$$

$$\text{Ou } e \leq 2v - 4$$

Exercícios

perguntas ao silvio → No processo de junção de arestas se eu encontrar um subgrupo mas sobrar arestas posso retirá-las?
 $|E| = 12$ $|V| = E/2 \rightarrow$ par

A)

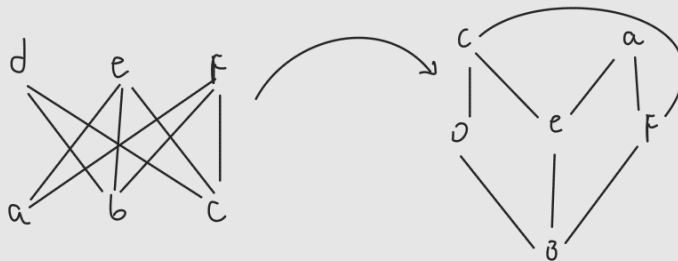


$$3v - 6$$

$$12 \leq 3 \cdot 6 - 6$$

$$12 \leq 12$$

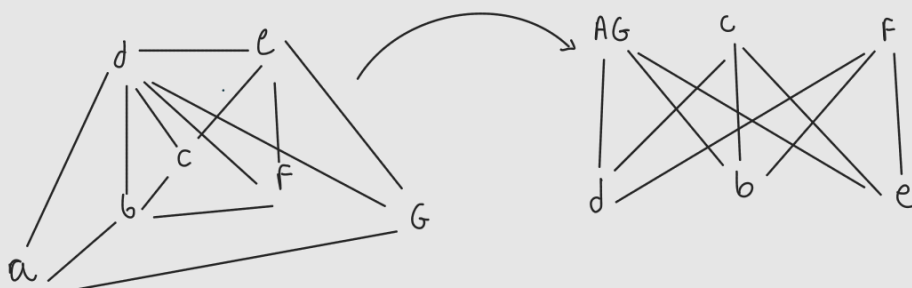
B)



$$8 \leq 3 \cdot 6 - 6$$

$$8 \leq 12$$

C)



$$13 \leq 3 \cdot 7 - 6$$

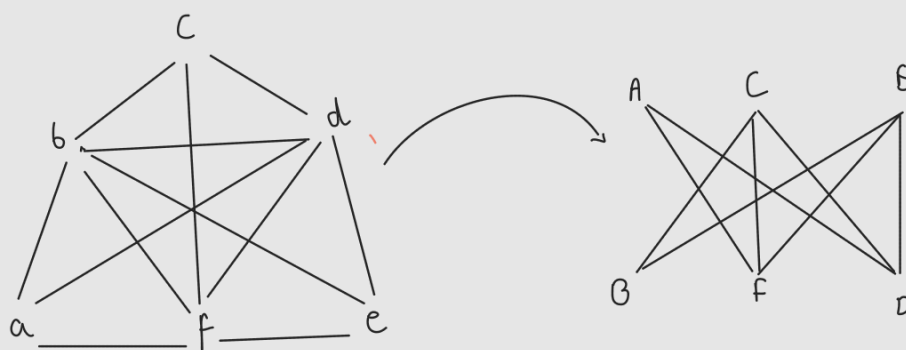
$$13 \leq 15?$$

$$13 \leq 2 \cdot 7 - 4$$

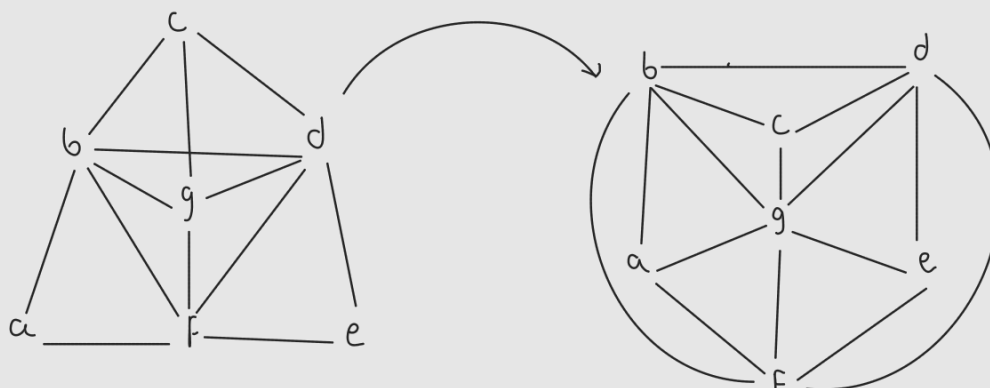
$$13 \leq 10?$$

perguntar se ambas derem falso como saber qual o graf K_5 ou $K_{3,3}$

D)



E)



f)

$$|E| = 14$$

