(4)

$X=\{1,2,3,4,5\}$

$T=\{\emptyset, X, \{1\}, \{3,4\}, \{1,3,4\}, \{2,3,4,5\}\}$

a) Se tiene que cumplir 3 requisitos:

i) X y $\emptyset \in T$

ii) La unión de cualquier familia de elementos de T pertenece a T

Probando las uniones duales se cumple Son $\binom{6}{2}=15$

$\emptyset \cup X = X$ $\quad$ $X \cup \{1\} = X$ $\quad$ $\{1\} \cup \{3,4\} = \{1,3,4\}$

$\emptyset \cup \{1\} = \{1\}$ $\quad$ $X \cup \{3,4\} = X$ $\quad$ $\{1\} \cup \{1,3,4\} = \{1,3,4\}$

$\emptyset \cup \{3,4\} = \{3,4\}$ $\quad$ $X \cup \{1,3,4\} = X$ $\quad$ $\{1\} \cup \{2,3,4,5\} = X$

$\emptyset \cup \{1,3,4\} = \{1,3,4\}$ $\quad$ $X \cup \{2,3,4,5\} = X$

$\emptyset \cup \{2,3,4,5\} = \{2,3,4,5\}$

$\{3,4\} \cup \{1,3,4\} = \{1,3,4\}$ $\quad$ $\{1,3,4\} \cup \{2,3,4\} = X$

$\{3,4\} \cup \{2,3,4,5\} = \{2,3,4,5\}$

iii) La intersección finita de elementos de τ pertenece a τ.

Viendo intersecciones duales Destarcá: Son $\left|\binom{6}{2}\right|=15$

$\phi \cap X = \phi$ $\quad X \cap \{1\} = \{1\}$ $\quad \{1\} \cap \{3,4\} = \phi$

$\phi \cap \{1\} = \phi$ $\quad X \cap \{3,4\} = \{3,4\}$ $\quad \{1\} \cap \{1,3,4\} = \{1\}$

$\phi \cap \{3,4\} = \phi$ $\quad X \cap \{1,3,4\} = \{1,3,4\}$ $\quad \{1\} \cap \{2,3,4,5\} = \phi$

$\phi \cap \{1,3,4\} = \phi$ $\quad X \cap \{2,3,4,5\} = \{2,3,4,5\}$

$\phi \cap \{2,3,4,5\} = \phi$

$\{3,4\} \cap \{1,3,4\} = \{3,4\}$ $\quad \{1,3,4\} \cap \{2,3,4\} = \{3,4\}$

$\{3,4\} \cap \{2,3,4,5\} = \{3,4\}$

La intersección finita de elementos de T pertenece a T

luego X es Topología

b) Subconjuntos cerrados: si $A = A'$ con $A' =$
= Adherencia

$$\left.\begin{aligned} \phi' &= \phi \\ X' &= X \\ \{1\}' &= \{1\} \\ \{3,4\}' &= \{3,4\} \\ \{1,3,4\}' &= \{1,3,4\} \\ \{2,3,4,5\}' &= \{2,3,4,5\} \end{aligned}\right\} \text{Son todos cerrados}$$