28

$A = \{p, q, r, s, t\}$

$B = \{q, s, t, u\}$

$C = \{q, r, t\}$

$X \subset A \mid A - X = \boxed{B \cap C}$
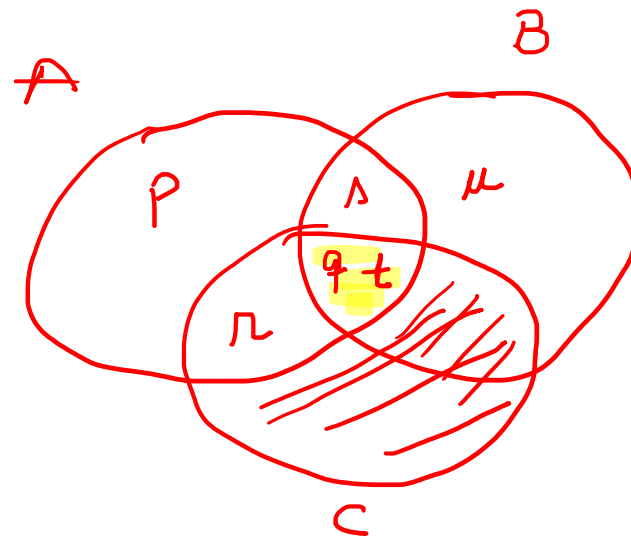
Logo, $X = \{p, r, s\}$



$A \cap B = \{q, s, t\}$

$A \cap C = \{q, r, t\} = C$

$C \subset A$

$B \cap C = \{q, t\}$
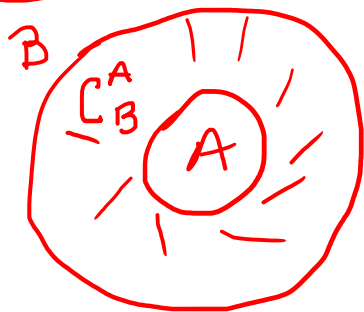
—//—

(29) $A \subset B \Rightarrow A \cup B = B$



$C_{A \cup B}^A \cup A = C_B^A \cup A = B$

(30)

U

$\overline{A}$

$\overline{B}$

$\overline{A} \cup \overline{B}$



pensando

$$\overline{A} = U - A = \complement_U^A$$
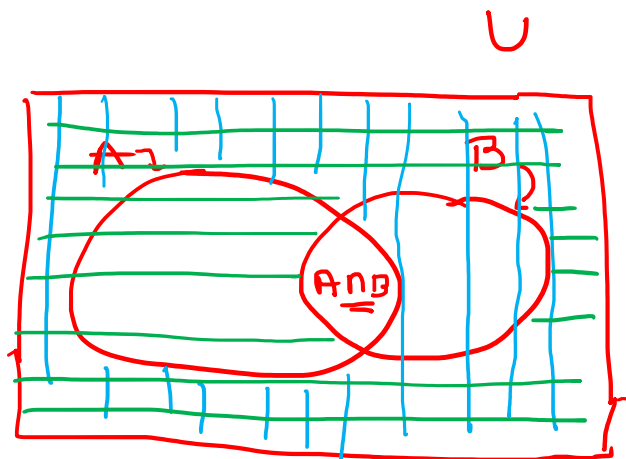
$$\complement_U^{\overline{A} \cup \overline{B}} = U - (\overline{A} \cup \overline{B}) = (A \cap B)$$

$x \in U$ e $x \notin \overline{A} \cup \overline{B}$

$\underbrace{x \notin \overline{A} \text{ ou } x \notin \overline{B}}$

$x \in (A \cap B)$
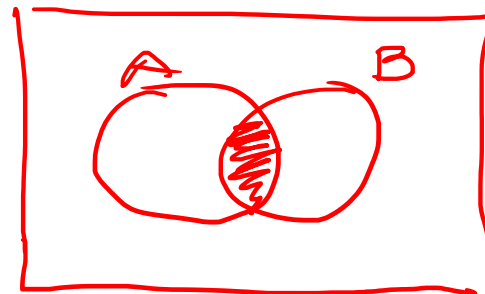


$$\complement_U^{\overline{A} \cup \overline{B}} = \overline{(\overline{A} \cup \overline{B})} = \overline{\overline{A}} \cap \overline{\overline{B}} = A \cap B$$

**C1**  M: conj. alunos mat; F: conj. alunos Fís; Q: conj. alunos Quím   U: turma
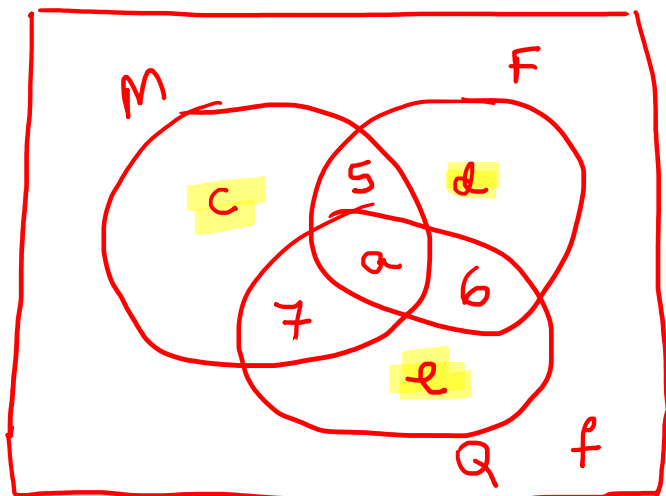


$a + b = a + 5 \implies \boxed{b = 5}$

$\implies$ $c + d + e = 150$

alunos que cursam | pelo menos uma das

3 disciplinas

$\boxed{A \cup B \cup C}$

no mínimo uma
pode fazer $\begin{cases} \text{exatal } e \ 1 \\ \text{ou} \\ \text{exatal } e \ 2 \\ \text{ou} \\ \text{exatal } e \ 3 \end{cases}$

$m(M \cap F) = m(M \cap F \cap Q) + 5$

$m((M \cap Q) - F) = 7$

$m((F \cap Q) - M) = 6$

$m(\bar{M} \cap \bar{F} \cap \bar{Q}) = f$

$n(A \cup B \cup C) = 190$

$c + 5 + d + 7 + a + 6 + e = 190$

$150 + 18 + a = 190$

$a = 22$

Resp  22 cursam
as 3 disciplinas

C2    A, B conj.

$n(A) = 7$
$n(B) = 5$

N° de subconj. de A : $2^7$

N° de subconj. de B : $2^5$

$2^7 - 2^5 = 128 - 32$

Teoria

A conj.
$n = n(A)$
n° subconj. de A é $2^n$

③ $A \subset U$ e $B \subset U$

$\overline{A} = C_U^A = \{2, 5, 7, 3, 9, 10, 13, 14\}$
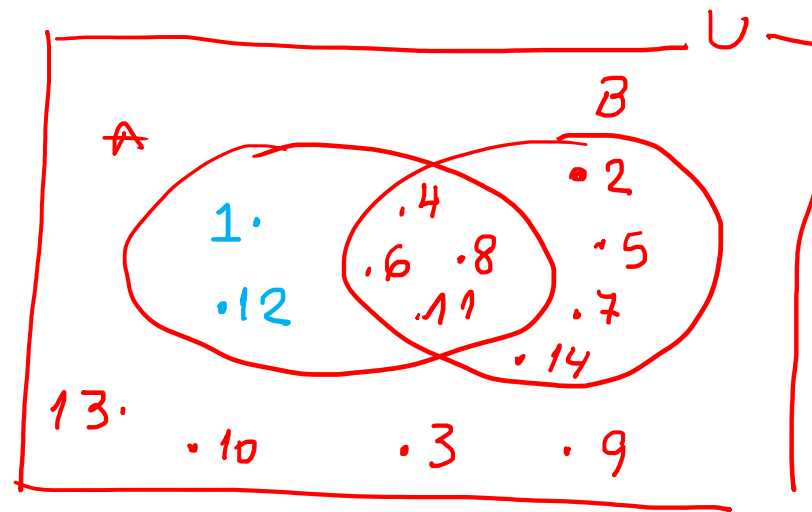
$A \cap B = \{4, 6, 8, 11\}$

$A \cup B = \{1, 2, 4, 5, 6, 7, 8, 11, 12, 14\}$

$2 \in \overline{A}$
$\overbrace{2 \notin A}$ e $2 \in A \cup B \Rightarrow 2 \in B$

$\underbrace{5 \notin A}$ e $5 \in A \cup B \Rightarrow 5 \in B$
$5 \in \overline{A}$

$1 \in A \cup B$ e $1 \notin \overline{A} \Rightarrow 1 \in A$

$12 \in A \cup B$ e $12 \notin \overline{A} \Rightarrow 12 \in A$



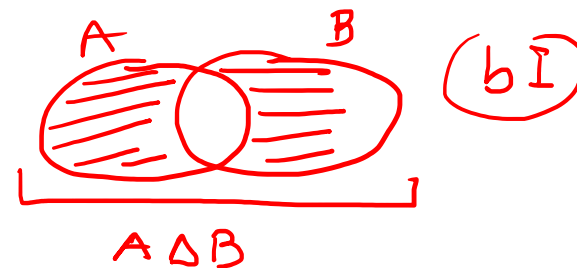$A = \{1, 12, 4, 6, 8, 11\}$

$B = \{4, 6, 8, 11, 2, 5, 7, 14\}$

$\overline{(A \cup B)} = \{13, 10, 3, 9\}$

C4   A,B conj.     A Δ B : diferença simétrica
                   A Δ B = (A - B) U (B - A)
                   A Δ B = (A U B) - (A ∩ B)


bI

a) A = {1, 2, 3, 4, 5}
   B = {2, 3, 5, 6, 7, 8}

   A - B = {1, 4}    x ∈ A - B ⟹ x ∈ A e x ∉ B

   B - A = {6, 7, 8}



A Δ B = {1, 4, 6, 7, 8}
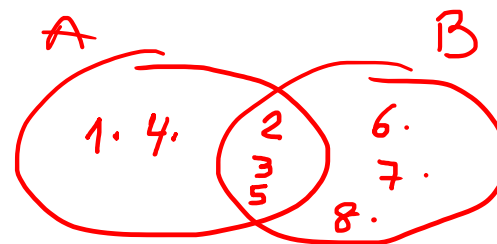

bII

BC A ⟹ A - B e B - A = ∅

A Δ B = (A - B) U ∅ = A - B

bIII
A ∩ B = ∅
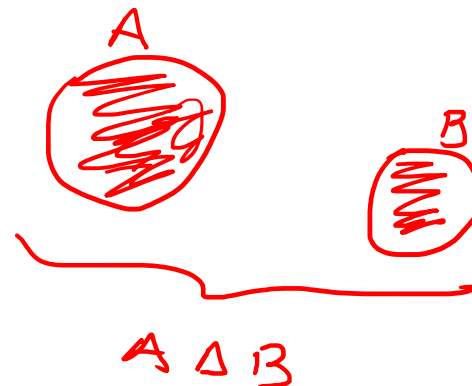

A Δ B

⑤ A,B,C,D conj. não vazios

$A \not\subset B$ $\begin{cases} \end{cases}$

ou

$B \not\subset A$

$C \supset (A \cup B)$

$A \cap B \supset D$

C

A          B

$A \cap B \neq \phi$

D

ou

C

A          B

$A \cap B = \phi$

$\Downarrow$

$D = \phi$

não convém

C6

A

B

U

35

72

85

43

29

27

57

C

44
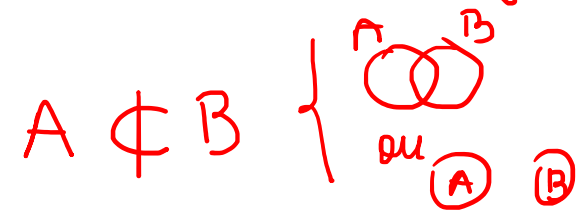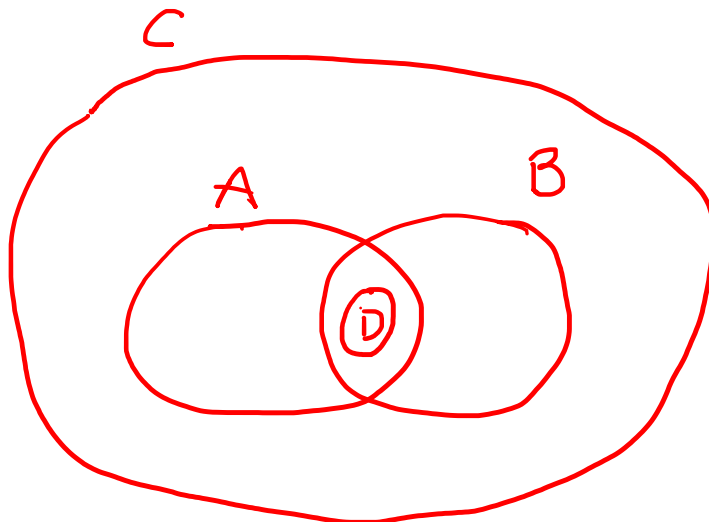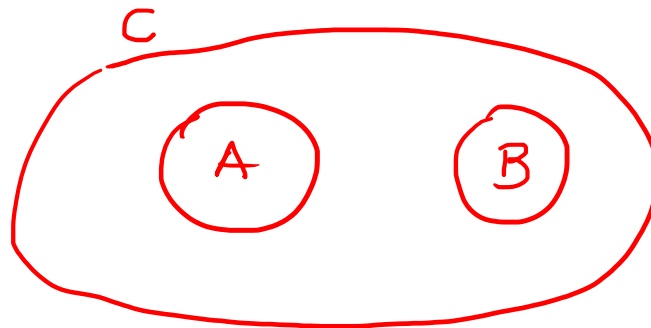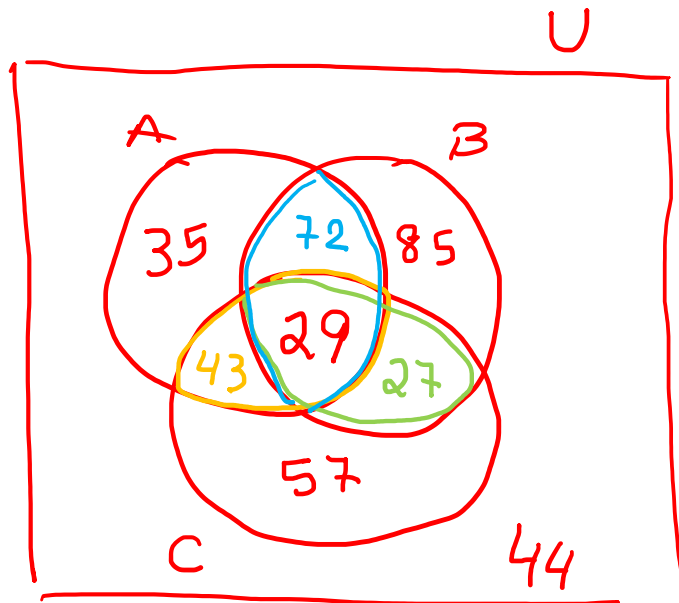
a) $m(U) = 35 + 72 + 85 + 27 + 57 + 44$

b) $m(A \cup B) = 35 + 43 + 72 + 29 + 85 + 27$

c) pelo menos 2 tipos ⟨ exatel2 2 ou exatele 3

$N = 72 + 43 + 27 + 29$

d) $m(\bar{A}) = 85 + 27 + 57 + 44$

T2    N: nº de funcionários
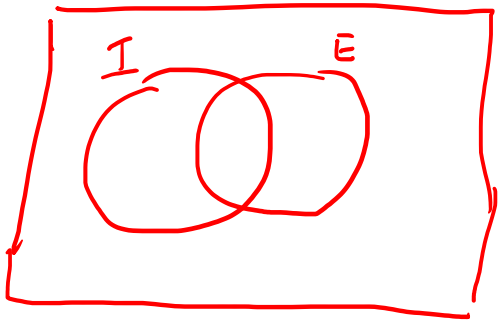
$$m(I) = 0,60N$$

$$m(E) = 0,45 \cdot N$$

$$m(\bar{I} \cap \bar{E}) = 0,30N$$

$$n(I \cap E) = 49$$

$$\Rightarrow \quad m(I \cup E) = 0,70 \, N$$

$$m(I \cup E) = m(I) + m(E) - m(I \cap E)$$

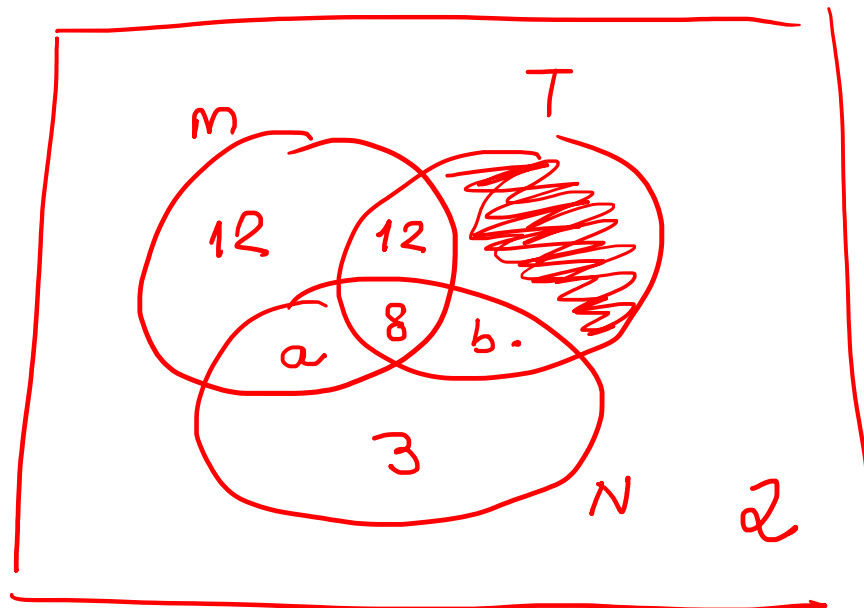$$0,70N = 0,60N + 0,45N - 49$$

$$49 = 1,05N - 0,70N$$

$$49 = 0,35N$$

$$N = \frac{49}{\frac{35\overline{7}}{\overline{100} \, 20}} = \overset{7}{49} \cdot \frac{20}{\overline{7}} \quad \Rightarrow \quad \boxed{N = 140}$$

T 12

m: manhã pisc
T: tarde pisc
N: noite pisc

$n(M \cup T \cup N) = 38$

$n(M \cap T) = 20$

$n(M \cap T \cap N) = 8$



$38 = 12 + 12 + \underbrace{\boxed{a + 8 + b + 3}}_{n(N)}$  e  $n(N) = a + 8 + b + 3$

$n(N) = 38 - 24 = 14$