

(Ε2)

ΑΣΚΗΣΕΙΣ - ΣΥΝΟΛΑ

(1)

① Ερώτηση (2) & (1)

$$(i) \{0, 2, 4, \dots\} = \{x \mid x = 2v, v \in \mathbb{N}\}$$

$$\mathbb{N} = \{0, 1, 2, 3, \dots\}$$

$$\text{Για } v=0 \quad x=0$$

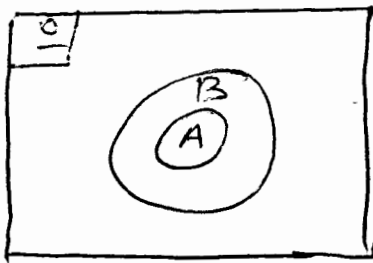
$$\text{Για } v=1 \quad x=2 \cdot 1 = 2$$

$$\text{Για } v=2 \quad x=2 \cdot 2 = 4$$

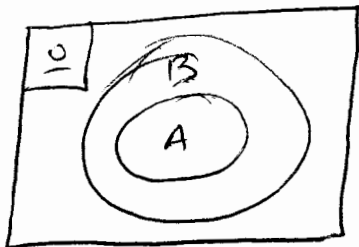
⋮

$$\text{Για } v=10 \quad x=2 \cdot 10 = 20$$

Άρα Σωστό

(ii) Αν $A \subseteq B$ τότε $A \cap B = B$ Άρα $A \cap B = A$

Άρα Λάθος

(iii) $(\phi')' = \underline{0}$ Λάθος αφού $(\phi')' = \phi$ (iv) $(\underline{0}')' = \phi'$ Σωστό(v) $\phi = \{0\}$ Λάθος② (i) $\{1, 2\} \subseteq \{1, 2, 3\}$ Σωστό(ii) Αν $A \subseteq B \Rightarrow A \cup B = B$ Σωστό

(iii) $2 \in \{1, 2, 3\}$ Λάθος

(2)

Το $2 \in \{1, 2, 3\}$, Διότι είναι στοιχείο του
Συνόλου. Δεν είναι σύνολο.

(iv) $x = \{x\}$ Λάθος

(v) $\emptyset \in \{\emptyset\}$ Λάθος

3 (i) $\{1, 2, 3\} = \{3, 2, 1\}$ Σωστό

(ii) $x^2 - 1 = 0 \Leftrightarrow x = 1 \wedge x = -1$

οπότε $A = \{-1, 1\}$

(iii) Αν $x \in \mathbb{Z}$ και $|x| \leq 1$ τότε το σύνολο των
Λύσεων είναι $A = \{-1, 0, 1\}$

$|x| \leq 1 \Leftrightarrow -1 \leq x \leq 1 \rightsquigarrow -1, 0, 1$

(iv) $\Omega = \{1, 2, 3, \dots, 10\}$, $A = \{1, 2, 3, 4\}$, $B = \{5, 6, \dots, 10\}$

$A \subseteq B$ (Λάθος)

$A' = B$ $A' = \{5, 6, 7, 8, 9, 10\} = B$ Σωστό

$A \cup B = \emptyset$ Λάθος $A \cup B = \Omega$

$A \cap B = \emptyset$ Σωστό

4 (i) $A = \{1, 2, 3\}$, $B = \{3, 4\}$

τότε $A \cup B = \{1, 2, 3, 4\}$

οπότε σωστό το (δ)

(ii) $x^2+1=0$ και $x-1=0$ είναι:

(3)

\downarrow Αδύνατο \downarrow $x=1$

αρα \emptyset (α)

(iii) Σύνολο των λύσεων $x(x^2-4)(x^2+4)(x^3+8)=0$

$\Leftrightarrow x=0$ ή $x^2-4=0 \Leftrightarrow x=2$ ή $x=-2$

$x^2+4=0$ αδύνατο

$x^3+8=0 \Leftrightarrow x^3=-8 \Leftrightarrow x=-\sqrt[3]{8} \Leftrightarrow x=-2$

$A = \{-2, 0, 2\}$ Σύνολο η (B)

(iv) $A = \{x \in \mathbb{R} \mid (x-1)^2 - 3 < 0\}$

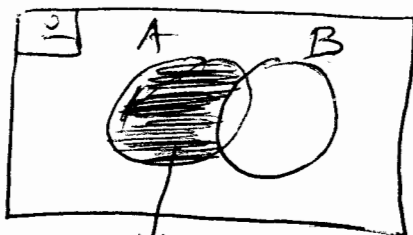
$(x-1)^2 - 3 < 0 \Leftrightarrow (x-1)^2 < 3 \Leftrightarrow$

$\Leftrightarrow |x-1| < \sqrt{3} \Leftrightarrow -\sqrt{3} < x-1 < \sqrt{3}$

$\Leftrightarrow -\sqrt{3}+1 < x < \sqrt{3}+1$

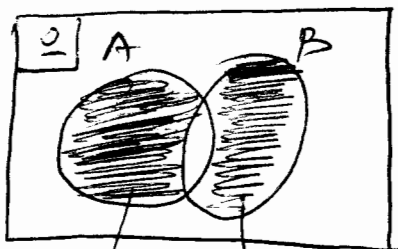
Σύνολο η (B)

5 (i)



$A-B$ ή $A \cap B'$ Σύνολο το B

(ii)



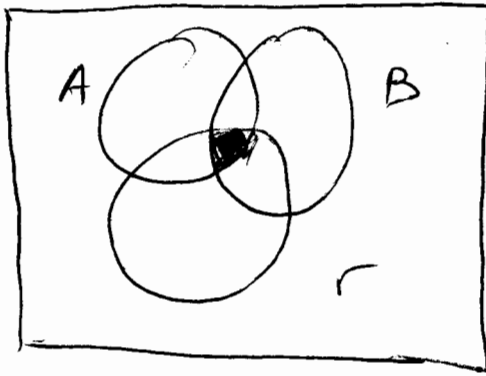
$A-B$ $B-A$

$(A-B) \cup (B-A)$

$(A \cap B') \cup (B \cap A')$

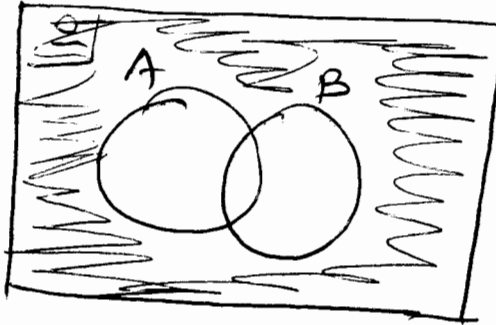
Σύνολο το (γ)

(iii)

 $A \cap B \cap \Gamma$

Σωστό το (B)

(iv)

 $(A \cup B)'$

Σωστό το (A)

6

Να παρασταθούν με αναγραφή

$$(a) A = \{x \in \mathbb{N} / x \text{ ψηφίο του αριθμού } 122334\}$$

$$A = \{1, 2, 3, 4\}$$

$$(b) B = \{x \in \mathbb{Z} / |x| \leq 3\}$$

$$|x| \leq 3 \Leftrightarrow -3 \leq x \leq 3$$

$$B = \{-3, -2, -1, 0, 1, 2, 3\}$$

$$(γ) \Gamma = \{x \in \mathbb{N} / 1 < x \leq 4\}$$

$$\Gamma = \{2, 3, 4\}$$

$$(7) (a) A = \{x \in \mathbb{Z} \mid x^2 = 9\}$$

$$x^2 = 9 \Leftrightarrow x = 3 \vee x = -3$$

$$A = \{-3, 3\}$$

$$(b) B = \{x \in \mathbb{Z} \mid x^4 + 27x = 0\}$$

$$x^4 + 27x = 0 \Leftrightarrow x(x^3 + 27) = 0$$

$$\Leftrightarrow x = 0 \vee x^3 = -27 \Leftrightarrow x = -3$$

$$B = \{-3, 0\}$$

$$(c) \Gamma = \{x \in \mathbb{N} \mid |x+2| = 1\}$$

$$|x+2| = 1 \Leftrightarrow x+2 = 1 \vee x+2 = -1$$

$$\Leftrightarrow x = -1 \vee x = -3$$

$$\text{δηλαδή } -1 \notin \mathbb{N} \text{ και } -3 \notin \mathbb{N}$$

$$\text{άρα } \Gamma = \emptyset$$

$$(8) \underline{\text{Περιγραφή}}$$

$$(a) A = \{-2, -1, 0, 1, 2\}$$

$$A = \{x \in \mathbb{Z} \mid |x| \leq 2\}$$

$$(b) B = \{-2, 2\}, \quad B = \{x \in \mathbb{Z} \mid x^2 = 4\}$$

$$(c) \Gamma = \{0, 1, 2, 3\} \quad \Gamma = \{x \in \mathbb{N} \mid 0 \leq x \leq 3\}$$

$$(9) (a) A = \left\{ x \in \mathbb{R} \mid x^2 = 3 \wedge 2x = 8 \right\}$$

$$x^2 = 3 \Rightarrow x = -\sqrt{3} \wedge x = \sqrt{3}$$

$$2x = 8 \Rightarrow x = 4$$

$$A = \emptyset$$

$$(b) B = \left\{ x \in \mathbb{R} \mid x^2 = 3 \wedge 2x = 8 \right\}$$

$$B = \left\{ -\sqrt{3}, \sqrt{3}, 4 \right\}$$

$$(d) \Gamma = \left\{ x \in \mathbb{R} \mid \frac{3-5x}{3} = \frac{x-1}{2} - \frac{13x}{6} \right\}$$

$$\frac{3-5x}{3} = \frac{x-1}{2} - \frac{13x}{6} \Rightarrow 2(3-5x) = 3(x-1) - 13x$$

$$\Rightarrow 6 - 10x = 3x - 3 - 13x \Rightarrow 0x = -9 \text{ αδύνατο}$$

$$\Gamma = \emptyset$$

$$(e) \Delta = \left\{ x \in \mathbb{R} \mid \frac{x}{3} + \frac{x}{2} + 5 = 5 \left(\frac{x}{6} + 1 \right) \right\}$$

$$\text{ή} \frac{x}{3} + \frac{x}{2} + 5 = \frac{5x}{6} + 5$$

$$\Rightarrow 2x + 3x + 30 = 5x + 30 \Rightarrow 5x + 30 = 5x + 30$$

$$\Rightarrow 0x = 0 \text{ ταυτότητα ή αόριστη}$$

$$(10) \quad A = \{0, 1, 2, 3\}, \quad B = \{-2, -1, 0, 1, 2, 3, 4\} \quad (\neq)$$

$$(a) \quad A \subseteq B$$

$$(B) \quad A \cup B = \{-2, -1, 0, 1, 2, 3, 4\} = B, \text{ αφού } A \subseteq B$$

$$A \cap B = \{0, 1, 2, 3\} = A, \text{ αφού } A \subseteq B$$

$$(1) \quad A' = \{-2, -1, 4\}$$

$$(11) \quad A = \{1, 2, 3\} \quad n=3 \text{ άρα } 2^3 = 8$$

$$\{1\}, \{2\}, \{3\}, \{1, 2\}, \{1, 3\}, \{2, 3\}, \emptyset, \{1, 2, 3\}$$

$$(19) \quad A = \{1, a^2\}, \quad B = \{a, 1\} \quad \Theta \varepsilon \cup \omega \quad A = B$$

$$\begin{cases} 1 = a \\ a^2 = 1 \end{cases} \quad \vee \quad \begin{cases} 1 = 1 \\ a^2 = a \end{cases}$$

$$\downarrow$$

$$a = 1 \vee a = -1 \vee a = 1$$

$$\text{άρα } a = 1$$

$$\downarrow$$

$$a^2 - a = 0$$

$$\Rightarrow a(a-1) = 0$$

$$\Rightarrow a = 0 \vee a = 1$$

$$\gamma \cup \alpha \quad \alpha = 0 \quad \Theta \varepsilon \cup \omega \quad a = 1 \quad \vee \quad a = 0$$

$$A = \{1, 0\}, \quad B = \{0, 1\}$$

$$\gamma \cup \alpha \quad a = 1$$

$$A = \{1, 1\}, \quad B = \{1, 1\}$$