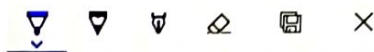


$$A4 | \Sigma | S1$$

$$x \in \mathbb{N}$$



I

$$f(x) = (x+1) \cdot 4 + x^2 = x^2 + 4x + 4 = x^2 + 2 \cdot x \cdot 2 + 2^2 = (x+2)^2 = f(x)$$

$$f(0) = 4 = 2^2 = (0+2)^2$$

$$\rightarrow f(1) = 9 = 3^2 = (1+2)^2$$

$$f(2) = 16 = 4^2 = (2+2)^2$$

$$f(3) = 25 = 5^2 = (3+2)^2$$

II) $\forall x \in \mathbb{N}$:

$$f(x) = 36 \Leftrightarrow (x+2)^2 = 36 \Leftrightarrow x+2 = \pm \sqrt{36} = \pm 6$$

$$\text{Αρ. } x+2 = 6 \quad \vee \quad x+2 = -6$$

$$x = 6 - 2 \quad \vee \quad x = -2 - 6$$

$$x = 4$$

Δεκχ

$x = -8$ Απορρίπτεται

Διότι $-8 \notin \mathbb{N} = \{0, 1, 2, \dots\}$

$$f(x) = 49$$

$$f(x) = 100$$

$$f(x) = 144$$

2ος Τρόπος

$$f(x) = 36 \Leftrightarrow (x+1) \cdot 4 + x^2 = 36 \Leftrightarrow x^2 + 4x + 4 - 36 = 0 \Leftrightarrow$$

$$x^2 + 4x - 32 = 0$$

$$\Delta = 4^2 - 4 \cdot 1 \cdot (-32) = 16 + 128 = 144 > 0$$

$$x_{1,2} = \frac{-4 \pm \sqrt{144}}{2 \cdot 1} = \frac{-4 \pm 12}{2} = \begin{cases} \rightarrow x_1 = \frac{-4+12}{2} = \frac{8}{2} = 4 \in \mathbb{N} \text{ Δεκχ} \\ \rightarrow x_2 = \frac{-4-12}{2} = \frac{-16}{2} = -8 \notin \mathbb{N} \text{ Απορρίπτεται} \end{cases}$$

$$\forall x \in \mathbb{N}: f(x) = 9 \Leftrightarrow (x+2)^2 = 9 \Leftrightarrow x+2 = \pm \sqrt{9} = \pm 3 \text{ Αρ.}$$

$$x+2 = 3 \Leftrightarrow x = 3 - 2 = 1$$

$$\vee \quad x+2 = -3 \Leftrightarrow x = -3 - 2 = -5 \text{ Απορρίπτεται}$$

$$x = 1$$

2151/AS

$$I) f(x) = \frac{4}{x-1} + 5$$

$\forall x \in \mathbb{R}$:

$$f(x) = 7 \Leftrightarrow$$

$$\frac{4}{x-1} + 5 = 7 \Leftrightarrow$$

$$\frac{4}{x-1} = 7 - 5 = 2 \Leftrightarrow$$

$$\frac{4}{x-1} = \frac{2}{1} \Leftrightarrow$$

$$2 \cdot (x-1) = 1 \cdot 4 \Leftrightarrow$$

$$2x - 2 = 4 \Leftrightarrow$$

$$2x = 4 + 2 = 6 \Leftrightarrow$$

$$\frac{2x}{2} = \frac{6}{2} \Leftrightarrow$$

$$x = 3 \text{ Δεκχ}$$

Βρισκω το πεδίο ορισμού της συνάρτησης
για να έχει νόημα ο τύπος πρέπει $1 \neq 0 \Leftrightarrow$

$$x-1 \neq 0 \Leftrightarrow \boxed{x \neq 1} \text{ Αρ. } A_f = \mathbb{R} - \{1\} = (-\infty, 1) \cup (1, +\infty)$$

Επαλήθευση

$$f(3) = \frac{4}{3-1} + 5 = \frac{4}{2} + 5 = 2 + 5 = 7 \text{ o.k.}$$

$$II) h(x) = \frac{1}{x^2+1}$$

$$x^2+1 \neq 0 \forall x \in \mathbb{R} \Rightarrow A_h = \mathbb{R}$$

$$h(x) = \frac{1}{5} \Leftrightarrow$$

$$\frac{1}{x^2+1} = \frac{1}{5} \Leftrightarrow$$

$$x^2+1 = 5 \Leftrightarrow$$

$$x^2 = 5-1$$

$$x^2 = 4$$

$$x = \pm \sqrt{4}$$

$$x = \pm 2 \text{ Δεκχ}$$

Σημ.
 Έργασία

$$\boxed{\frac{A \cup B}{A \cap B}}$$

$$f(x) = 3x-1 \xrightarrow{\forall x} x: f(x) = 5$$

$$3x-1 = 5 \Leftrightarrow$$

$$3x = 1+5 \Leftrightarrow$$

$$3x = 6 \Leftrightarrow$$

$$\frac{3x}{3} = \frac{6}{3} \Leftrightarrow$$

$$x = 2$$

$$\boxed{f(x) = 9}$$

$$3x-1 = 9$$

$$3x = 10$$

$$\frac{3x}{3} = \frac{10}{3}$$

$$x = \frac{10}{3}$$