

**Soluție:**

1.  $f(\sqrt{5}) = \frac{1}{\sqrt{5}-2} \Leftrightarrow a\sqrt{5} + b = \sqrt{5} + 2 \Rightarrow a=1, b=2.$

2. a)  $G_f \cap Oy = \left\{ A\left(0, \frac{4}{3}\right) \right\}; G_f \cap Ox = \{B(2,0), C(4,0)\}.$

b) C.E.:  $x \neq 0, y \neq 0. \begin{cases} x+y=7 \\ xy=10 \end{cases} \Rightarrow (x,y) \in \{(2,5), (5,2)\}.$

3.  $f(x) = 3a^2x^2 + 2ax(c+d+e) + (c^2+d^2+e^2) \Rightarrow f_{\min} = -\frac{[(c+d+e)]^2 - 3(c^2+d^2+e^2)}{3}.$

4. a)  $\sqrt{x-1} + \sqrt{x+1} = 2 \Rightarrow \sqrt{(x-1)(x+1)} = 2-x \Rightarrow 4x=5 \Leftrightarrow x = \frac{5}{4},$  verifică condițiile inițiale.

b)  $\begin{cases} x^2+1 > 0, \forall x \in \mathbb{R} \\ x^2+1 \neq 1 \\ 5-4x > 0 \end{cases} \Rightarrow \begin{cases} x \neq 0 \\ x < \frac{5}{4} \end{cases} \Rightarrow x \in (-\infty, 0) \cup \left(0, \frac{5}{4}\right).$