

**Soluție:**

1.  $2m - 1 = 0 \Rightarrow m = \frac{1}{2}.$

2. a)  $G_f \cap Oy = \{A(0, 5)\}, G_f \cap Ox = \left\{B(-1, 0), C\left(\frac{5}{2}, 0\right)\right\}.$

b)  $\Delta = 41 > 0; \quad x_1^2 x_2 + x_1 x_2^2 - x_1 x_2 + 1 = x_1 x_2 (x_1 + x_2) - x_1 x_2 + 1 = -2 \cdot \frac{3}{2} + 2 + 1 = 0.$

3.  $\text{Im } f = \left[-\frac{\Delta}{4a}, \infty\right) = [-1, \infty) \Leftrightarrow \begin{cases} a = m - 2 > 0 \\ -\frac{\Delta}{4a} = -1 \end{cases} \Rightarrow \begin{cases} m > 2 \\ \frac{(m-3)^2 - (m-2)(m-4)}{m-2} = 1 \end{cases} \Rightarrow m = 3.$

4. a)  $C.E.: x \geq -5; \sqrt{x+5} = \sqrt{x^2 + x + 1} \Rightarrow x + 5 = x^2 + x + 1 \Rightarrow x_{1,2} = \pm 2.$

b)  $\log_{0,5} \frac{2^{x^2}}{32} = 1 \Leftrightarrow \frac{2^{x^2}}{32} = 0,5 \Leftrightarrow 2^{x^2-5} = 2^{-1} \Leftrightarrow x^2 - 4 = 0 \Leftrightarrow x \in \{-2, 2\} \cap \mathbb{N} = \{2\}.$