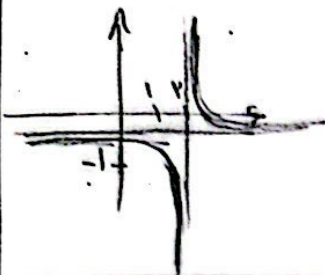


$$= 4a^3 - 4 > 12a - 10 = 4a^3 - 12a + 14 > 0 = 4(a-1)(a^2 + 3a - 1) > 0$$

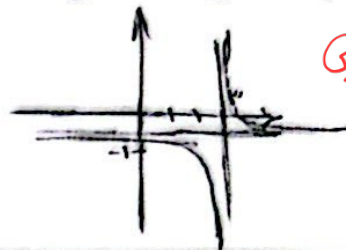
$$a=1 \quad \Delta = 12 \quad a = \frac{-3 \pm 4}{2} = \begin{cases} 1 \\ -2 \end{cases}$$

$$y = \frac{3x+1}{x-2} \rightarrow -\frac{1}{x-2}$$



تابع هذو رافعت و پست و وارون بدلاست.

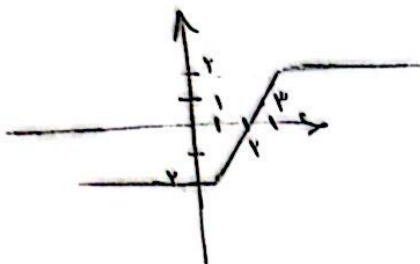
$$y = \frac{3x+1}{x-2} \rightarrow yx - 2y = 3x+1 \rightarrow yx - 3x = 2y+1 \rightarrow x(y-3) = 2y+1 \rightarrow x = \frac{2y+1}{y-3}$$



فونكسيون وارون بدلاست

$$f(x) = |x-1| - |x-3|$$

$$[a, b] = [1, 3]$$



$$f(x) = 2x - 2 \rightarrow 2x = y + 2 \rightarrow x = \frac{y+2}{2} \rightarrow f^{-1}(x) = \frac{x+2}{2}$$

$$f(x) = \begin{cases} x^2 + 1 & x \geq 1 \\ 2x - 1 & x \leq 0 \end{cases}$$

پست و پست و وارون بدلاست.

$$y = x^2 + 1 \rightarrow x^2 = y - 1 \rightarrow x = \sqrt{y-1} \rightarrow f^{-1}(x) = \sqrt{x-1} \quad x \geq 2$$

$$y = 2x - 1 \rightarrow 2x = y + 1 \rightarrow x = \frac{y+1}{2} \rightarrow f^{-1}(x) = \frac{x+1}{2} \quad x \leq -1$$

$$f(x) = x^2 - \frac{(x+1)^2}{x+3} \rightarrow f^{-1}(x) = \frac{ax+b}{cx+d}$$

$$f(b) = ? \quad (b < 0) \quad f(-1) = +\infty$$

$$y = x^2 - \frac{(x+1)^2}{x+3} \rightarrow y - x^2 = -\frac{(x+1)^2}{x+3}$$

$$\rightarrow x^2 - y = \frac{(x+1)^2}{x+3} \rightarrow (x^2 - y)(x+3) = (x+1)^2 \rightarrow (x^2 - y)(x+3) - (x+1)^2 = 0$$

$$\rightarrow x^3 + 3x^2 - yx - 3y - x^2 - 2x - 1 = 0 \rightarrow x^2 + 3x - yx - 3y - 2x - 1 = 0 \rightarrow x^2 + (3-y)x - 3y - 2x - 1 = 0$$

$$\rightarrow x = \frac{-3y-1}{3-y} \rightarrow y = \frac{-4x-1}{x+3} \quad x \neq -3 \rightarrow \frac{-4x-1}{x+3} = \frac{ax+b}{cx+d} \rightarrow a = -4, b = -1, c = 1, d = 3$$

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

$$x = \frac{1 \pm \sqrt{1-4y}}{2y} \quad y \neq 0$$

$$y = \frac{x}{x^2+1} \rightarrow yx^2 + y = x \rightarrow yx^2 - x + y = 0$$

$$f^{-1}(x) = \frac{1 \pm \sqrt{1-4x^2}}{2x} \quad x \neq 0$$