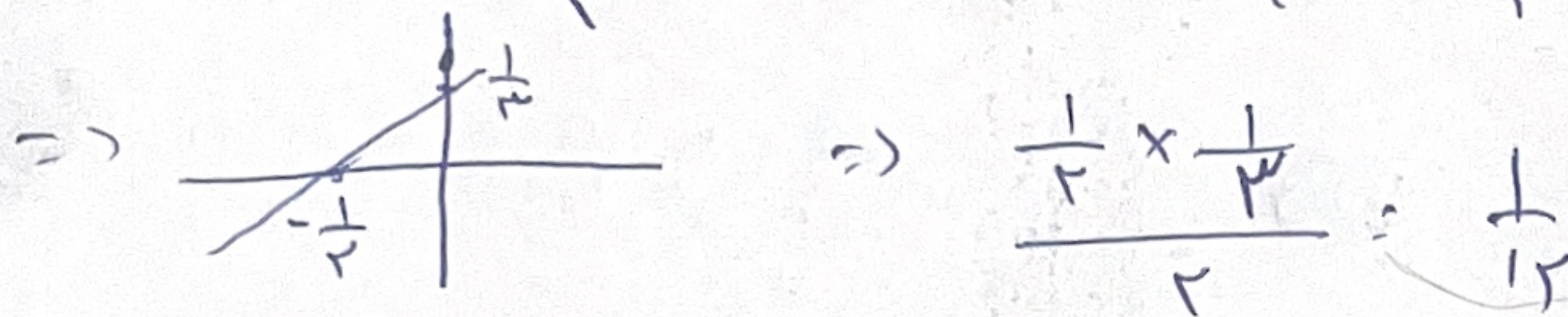
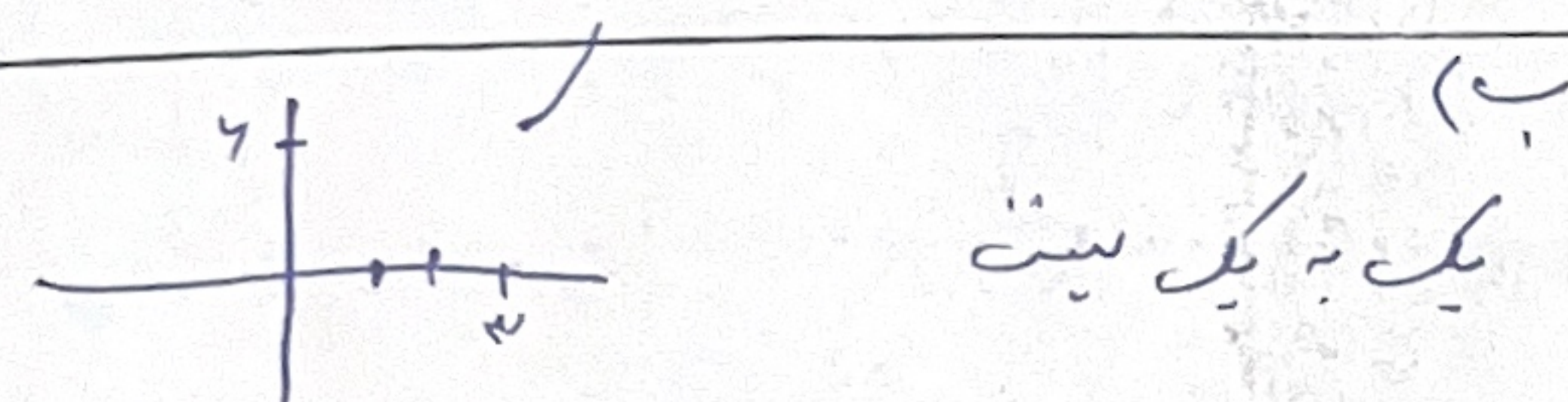


$$2y+1=3x \Rightarrow \frac{2y+1}{3} = x \Rightarrow f^{-1}(x) = \frac{2}{3}x + \frac{1}{3}$$

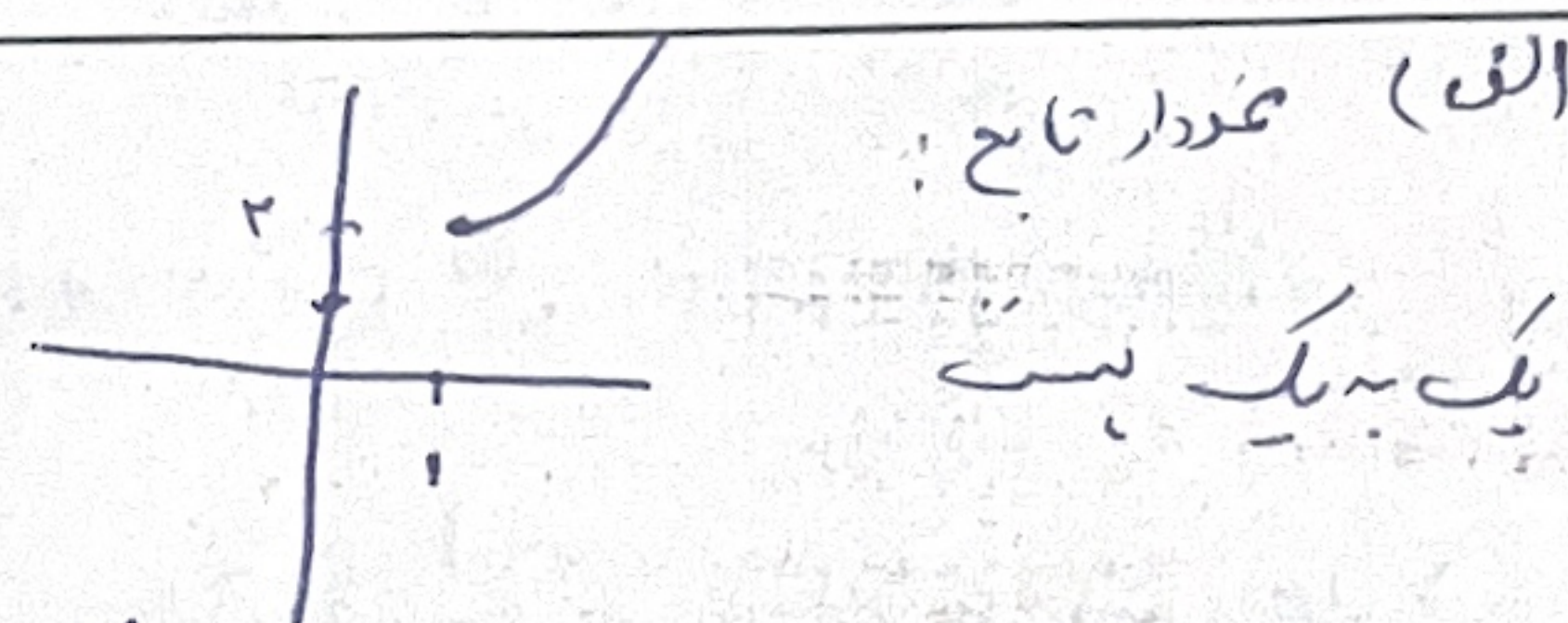


۱



$$x^2 - 2x + 4 - 1 = y \Rightarrow f(x) = \sqrt{x+1} + 2$$

$$x \in [4, +\infty)$$



$$x^2 - 2x + 4 - 1 = y \Rightarrow (x-2)^2 - 1 = y$$

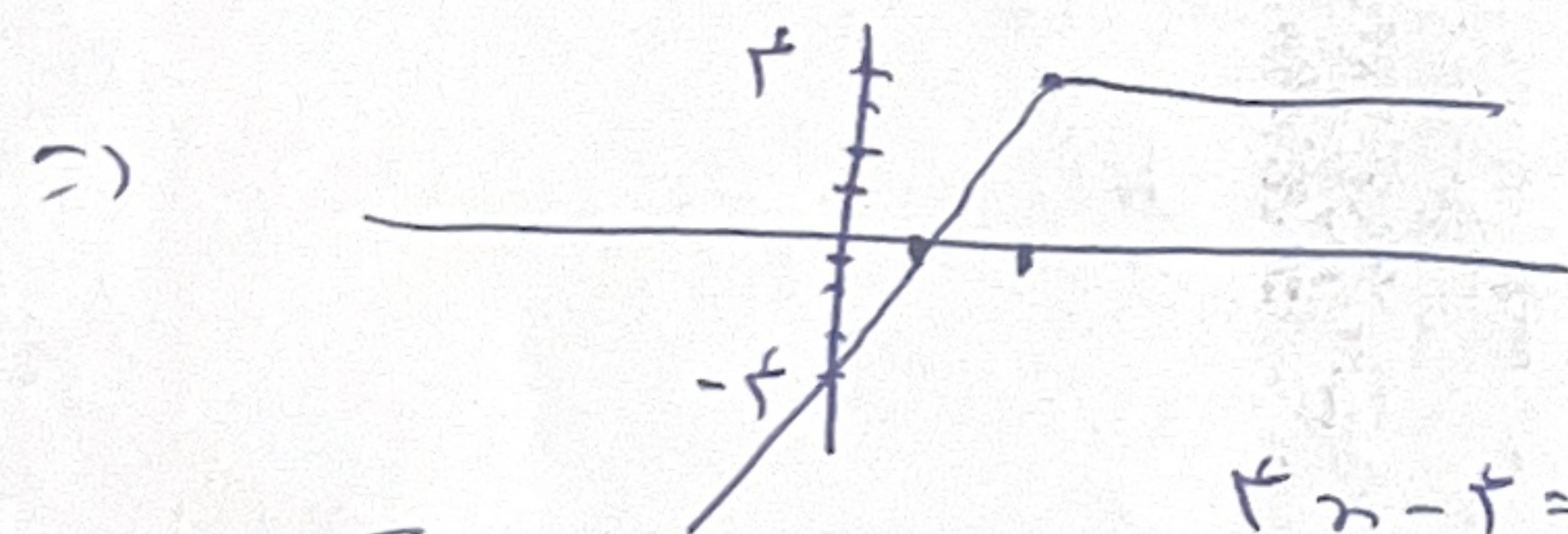
$$\Rightarrow (x-2)^2 = y+1 \Rightarrow x-2 = \pm\sqrt{y+1}$$

$$\Rightarrow y = \sqrt{x+1} + 2 \text{ و } x \in [2, +\infty)$$

۲

$$f(x) = 2x - \sqrt{4x^2 - 12x + 14} = 2x - \sqrt{4(x-2)^2} = 2x - 2|x-2|$$

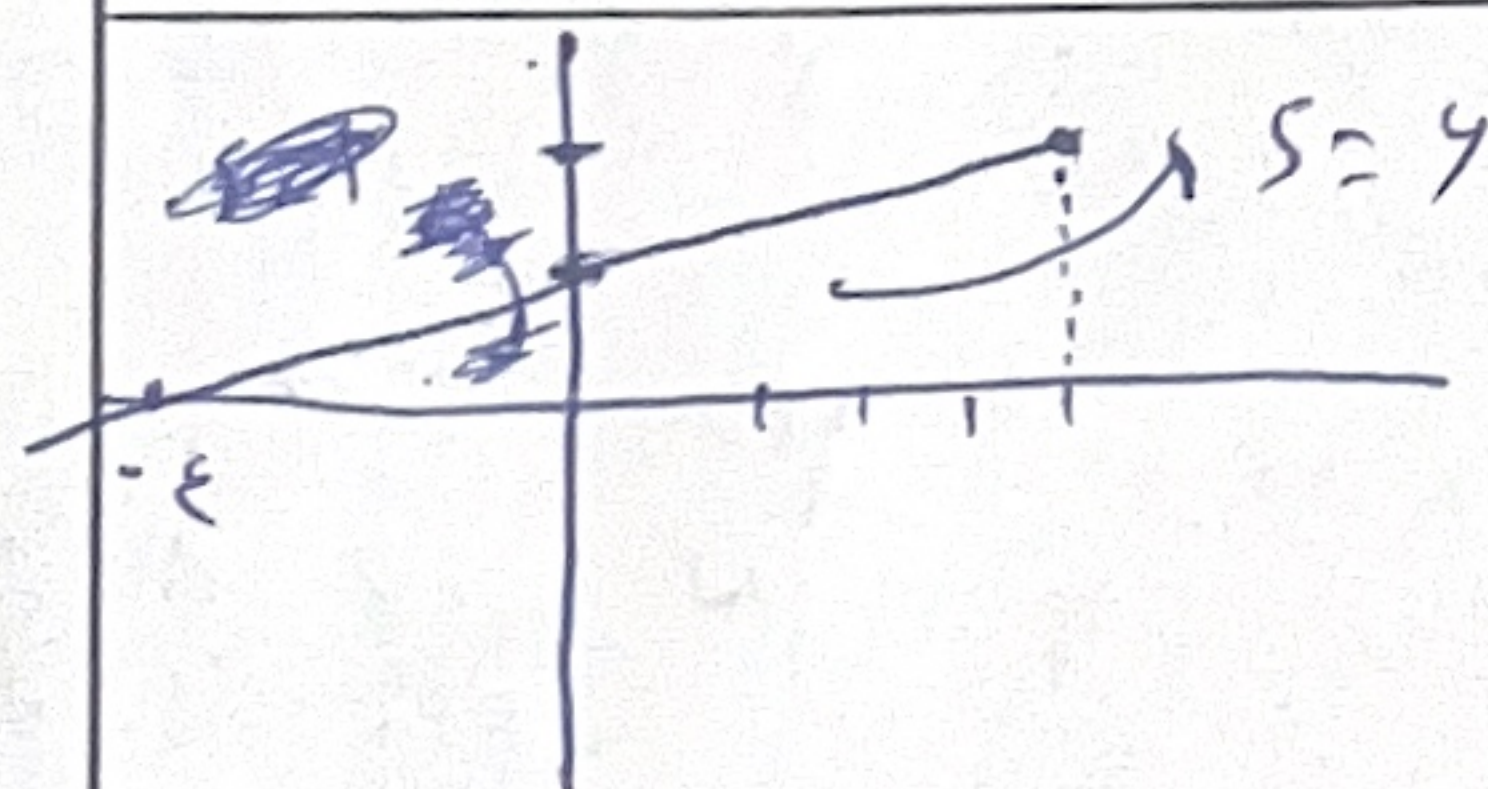
$$x \geq 2$$



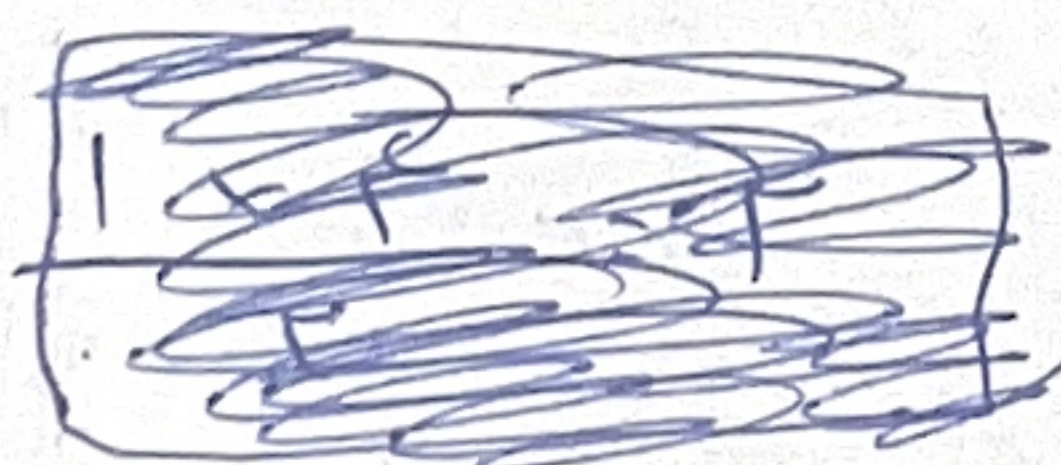
$$4x - 4 = y \Rightarrow f^{-1}(x) = \frac{x+4}{4} = \frac{1}{4}x + 1$$

$$x \geq 2 \text{ و } x < 2 \text{ محسوس نیست}$$

۳



$\Rightarrow$



$$\frac{(1+2)^2}{4} = 4$$

۴

$$\frac{x_1}{\sqrt{x_1^2 - 5}} = \frac{x_2}{\sqrt{x_2^2 - 5}} \Rightarrow x_2 \sqrt{x_1^2 - 5} = x_1 \sqrt{x_2^2 - 5}$$

$$\Rightarrow x_2^2 (x_1^2 - 5) = x_1^2 (x_2^2 - 5) \Rightarrow x_1^2 x_2^2 - 5x_2^2 = x_1^2 x_2^2 - 5x_1^2$$

$$\Rightarrow x_1^2 = x_2^2 \Rightarrow x_1 = \pm x_2$$

تفاوت

مخلاف

چند یک عدد مثبت
باید عدد منفی
برابر نمی شود

۵

ضابطه سکوس:

$$D_f = (-\infty, -\sqrt{\omega}] \cup [\sqrt{\omega}, +\infty)$$

$$y^r = \frac{x^r}{x^r - \omega} \Rightarrow \sqrt{\frac{\omega y^r}{y^r - 1}} = x \Rightarrow |y| \sqrt{\frac{\omega}{y^r - 1}} = x$$

$$\Rightarrow f^{-1}(x) = x \sqrt{\frac{\omega}{x^r - 1}} \quad \text{علاقت } x \text{ و } n \text{ باید یکسان باشد}$$

$$g(r) = k - f \Rightarrow y_{\max} < k - f \Rightarrow n_{\max} \quad (-x^r + yx + rk)$$

$$\Rightarrow y_{\max} = -r + 1r + rk \Rightarrow rk + 1 < k - f$$

$$\Rightarrow rk < -1r \Rightarrow k < -r$$

$$x > 0 \Rightarrow \frac{x}{r}, \quad ax + bx = \frac{1}{r}x \quad x > 0$$

$$x < 0 \Rightarrow \frac{x}{r}, \quad ax - bx = \frac{1}{r}x \quad x < 0$$

$$\Rightarrow a + b = \frac{1}{r}, \quad a - b = \frac{1}{r} \Rightarrow a = \frac{r}{2}, \quad b = -\frac{1}{2r}$$

$$\Rightarrow ab = -\frac{r}{4r}$$

$$f(r) = \frac{r+k}{r+m} = -10 \Rightarrow m = -r \Rightarrow f^{-1}(x) = \frac{rx+k}{x-r}$$

$$f \circ f^{-1}(x) = x \quad x \neq r$$

$$\Rightarrow x + \frac{rx+k}{x-r} = x \Rightarrow \frac{rx+k}{x-r} = 0 \Rightarrow x = -\frac{k}{r}$$

$$f^{-1}(-r) = a, \quad g^{-1}(f) = b \Rightarrow f(a) = -r, \quad g(b) = k$$

$$\Rightarrow a = r - rn \Rightarrow f\left(\frac{a}{r}\right) = -r - g\left(\frac{a}{r}\right)$$

$$\Rightarrow g\left(\frac{a}{r}\right) = k \Rightarrow b = \frac{a}{r}, \quad a = r - rn$$

$$\Rightarrow k + \frac{a}{r} + r - rn = r = k g^{-1}(f) + f^{-1}(-r)$$

فرسینه تابع :

$$-\frac{-\omega x - 13}{1+x} = \frac{\omega x + 13}{1+x}$$

دو دانه برابر است

$$\frac{\omega(x-2) + 13}{1+x-2} = \frac{\omega x + 13}{x-1}$$

پایین دانه برابر است

$$= \frac{\omega x + 13 - 2\omega x - 26}{x-1} = \frac{-\omega x - 13}{x-1} = f(x)$$

$$f'(x) = -\frac{x}{x-1} = \frac{x}{x-1}$$

$$\Rightarrow \frac{x}{x-1} = \frac{1}{x-1} \Rightarrow x = 1$$

$$\Rightarrow x = 9$$

نقطه بر فرد :

$$\frac{2x+7}{x-1} = x \Rightarrow 2x+7 = x^2-x$$

$$\Rightarrow x^2-3x-7=0 \Rightarrow x = \frac{3 \pm \sqrt{9+28}}{2} = \frac{3 \pm \sqrt{37}}{2}$$

(مجموع طور نقاط بر فرد)

$$y = x + f[x] \Rightarrow x = y + f[y] \Rightarrow y = x - f[y]$$

$$g[x] = [y + f[y]] \Rightarrow [x] = \omega[y]$$

$$\Rightarrow \frac{[x]}{\omega} = [y] \Rightarrow y = x - \frac{f[x]}{\omega}$$

$$(f-g)(x) = x + f[x] - x + \frac{f[x]}{\omega} = \frac{f_0[x] + f[x]}{\omega}$$

$$= \frac{f_0[x]}{\omega}$$