

عین شهاب زری

۱. (۱۵, ۵)

$$f(x) = m + [x]$$

۱۵, ۵

$$m + [x] = x - \frac{1}{r} [x]$$

$$[x] = -\frac{1}{r} [x] \quad [x] \left(\frac{1 + \frac{1}{r}}{\frac{r}{r}} \right) = 0$$

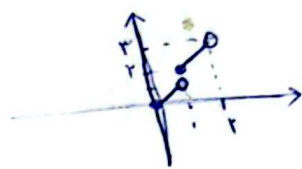
$$f'(x) = m - \frac{1}{r} [x]$$

برای $x \in [0, 1)$ برقرار نیست!

$$f \circ f^{-1} = rx - \frac{r}{r}$$

$$rx - \frac{r}{r} = x \quad x = \frac{r}{r} \quad x = \frac{r}{r} \text{ صحیح}$$

$$Rf = [0, 1) \cup [r, r) \cup \dots$$



$$y = \frac{ax+r}{x+b}$$

$$a=b \Rightarrow f \circ f^{-1}(x) = f \circ f^{-1}(x) = x$$

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

مماس = y

$$f'(x) = f(x) \Rightarrow \frac{ax+r}{x+b} = \frac{bx+r}{x+a} \Rightarrow a=b$$

توابع هموار فایب آنرا بدون خود را قطع نشد، محل تقاطع روی نمودار ناحیه اول در رسم

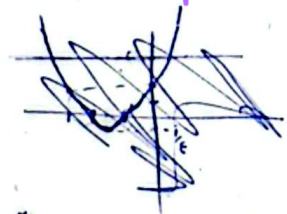
است!

$$f(x) = \frac{mx+r}{x+m+r}$$

$$\frac{mx+r}{x+m+r} = x \quad mx+r = x^2 + mx + rx$$

$$x^2 + rx - r = 0 \quad \checkmark \quad \frac{1}{\alpha} + \frac{1}{\beta} = \frac{x+\beta}{\alpha\beta} = \frac{r}{p} = \frac{-r}{-r} = 1$$

$$(x+r)(x+r) \quad (x+r)(x+r) \quad (x+r)(x+r)$$



۱۱

$$x^2 + rx - r = 0 \quad \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \frac{-r \pm \sqrt{r^2}}{2}$$

$$\Delta = b^2 - 4ac \Rightarrow a - f(1) - r = 21$$

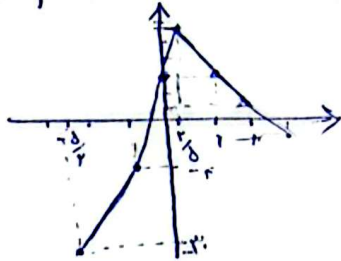
$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\sqrt{r^2} - r}{2} + \frac{r - \sqrt{r^2}}{2} = 0$$

$$\alpha = \frac{\sqrt{r^2} - r}{2} \rightarrow \frac{1}{\alpha} = \frac{2}{\sqrt{r^2} - r} \times \frac{\sqrt{r^2} + r}{\sqrt{r^2} + r} = \frac{2(\sqrt{r^2} + r)}{r^2 - r}$$

$$f(x) = \sqrt{(x+r)^2} - \sqrt{(x-r)^2} = |x+r| - |x-r|$$

(1, 2) - r

$$x_{n-1} - r \quad | \quad x_n + r \quad | \quad -x_n + r$$



$$f'(x) = \frac{x-r}{r}, \quad \text{for } x > r$$

$$D_{f^{-1}} = R_f = x \leq \frac{r}{0}$$

$$f(x) \rightarrow x \text{ (identity)}$$

$$L^{-1}(u) = a f^{-1}\left(\frac{u+b}{c}\right) + d$$

$$L(x) = r f(x_n) - 1$$

$$f^{-1}\left(\frac{u+b}{c}\right) = \frac{L^{-1}(u) - d}{a}$$

$$f(x_n) = \frac{L(x_n) + 1}{r}$$

for

$$f^{-1}\left(\frac{L(x_n) + 1}{r}\right) = x_n \Rightarrow f^{-1}(f(x_n)) = x_n$$

$$f(x_n) = \frac{L(x_n) + 1}{r} \quad \begin{matrix} b=1 \\ c=r \end{matrix}$$

$$L^{-1}(L(x)) = a f^{-1}\left(\frac{L(x)+b}{c}\right) + d$$

$$\frac{L(x)+b}{c} = f(x_n)$$

$$x = a f^{-1}\left(\frac{L(x)+b}{c}\right) + d$$

$$\begin{matrix} d=0 \\ a=1/r \end{matrix}$$

$$\frac{ac+d}{rb} = \frac{\frac{1}{r} \cdot r + 0}{1 \cdot r} = \frac{1}{r} \quad \checkmark$$

$$f(x) = x + r\sqrt{x}$$

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

~~scribbles~~

$$f'(x) = (\sqrt{x} + 1)^2 \quad \checkmark$$

~~scribbles~~

$$R_f = [0, +\infty)$$

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$$D_{f^{-1}} : x \in D_{f^{-1}}, f^{-1} \in D_f : \{x \in [0, +\infty)\} = R_f$$

وقت!

(1, 2) - r

$$y = x - 1 + r^x \rightarrow r^x + x - 1$$

$$r^x + x - 1 = x$$

$$r^x - 1 = 0 \quad r^x = 1 \Rightarrow \boxed{x=0} \quad \checkmark$$

چند آیه عددی معلوم
خود را در نیاز ۱ و ۲ می زند

(۲)

$$y' = x r^{x-1} + 1 \xrightarrow{x=0} y' = 1 \quad \text{سبب } c$$

$$f'_{\text{سبب } c} = -1$$

$$f(x) = x^2 + f_x$$

$$y = \sqrt{f^{-1}(x) - x}$$

$$f^{-1}(x) \geq x$$

$$f(f^{-1}(x)) \geq f(x)$$

$$x \geq x^2 + f$$

$$x^2 + f_x \leq x$$

$$x^2 + f_x \leq 0$$

x	-	+
$x^2 + f$	+	+
$f^{-1}(x)$	-	+

$$D_{f^{-1}} = (-\infty, 0]$$

$$\{x \in (-\infty, 0] : x \notin \mathbb{R}^-\} = \{0\}$$

اعداد

(۲)

$$f(x) = -x + \sqrt{x+f}$$

$$-x - f + \sqrt{x+f} + f \Rightarrow -(x+f) + \sqrt{x+f} + f \rightarrow -t + \sqrt{t} + f$$

$$y = -t + \sqrt{t} + f \quad t + \sqrt{t} - f \quad y = (t + \frac{1}{f})^r - \frac{1}{f} \quad g(x) = (\sqrt{x + \frac{1}{f}} - \frac{1}{f})^r - f$$

$$y = (\sqrt{x+f} + \frac{1}{f})^r - \frac{1}{f} \quad x = (\sqrt{y + \frac{1}{f}} - \frac{1}{f})^r - f$$

$$(\sqrt{x + \frac{1}{f}} - \frac{1}{f})^r - f = x - f \quad (\sqrt{x + \frac{1}{f}} - \frac{1}{f}) = \sqrt{x+1} \quad \sqrt{x + \frac{1}{f}} = \sqrt{x+1} + \frac{1}{f}$$

$$x + \frac{1}{f} = x + \frac{1}{f} + \sqrt{x+1} \quad \sqrt{x+1} = f \quad x+1 = 9 \quad \boxed{x=8}$$

$$\left\{ x \in D_{g(x)} : g(x) \in D_f \right\}$$

جواب صفحه ۹۰...

$$\sqrt{x} + \sqrt{y} = 2 \quad \text{تابع وارون پذیر است}$$

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

$$x \in D_f$$

$$\sqrt{y} = 2 - \sqrt{x}$$

$$y = (2 - \sqrt{x})^2$$

$$x \geq 0$$

$$y = (2 - \sqrt{x})^2$$

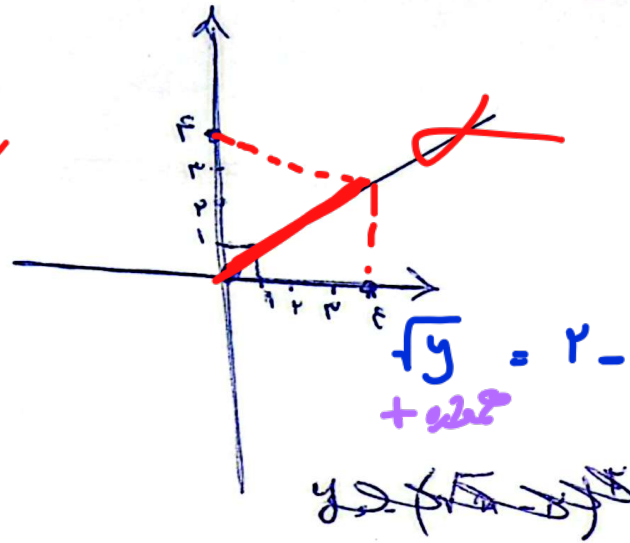
$$y \geq 0$$

$$f^{-1}(x) \xrightarrow{\text{به چپ واحد}} f^{-1}(x+4) \xrightarrow{\text{به راست}} f^{-1}(x)$$

$$g(x) = f^{-1}(x+4) = x-3 \xrightarrow{\text{از طرف راست}} f \circ f^{-1}(x+4) = f(x-3)$$

$$x+4 = -(x-3) + \sqrt{x+1} \rightarrow 2x+1 = \sqrt{x+1} \quad \text{توان}$$

$$4x^2 + 3x = 0 \rightarrow \begin{cases} x=0 \\ x=-\frac{3}{4} \end{cases} \quad \text{جواب رادیکال روستقرینه}$$



(1, 1.75)

به دافنه توجه کن!

$$\sqrt{y} = 2 - \sqrt{x} \geq 0 \rightarrow 0 \leq x \leq 4$$

$$y = (2 - \sqrt{x})^2$$