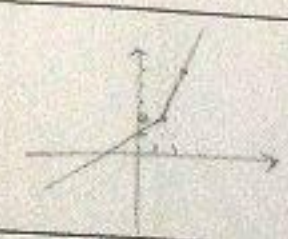


معکوس پذیر است. معکوس آن را بیابید.

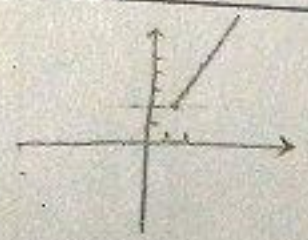
آل واری
باز هم دفتر
کتابت

الف) $m=3$, $n^2-n+2 \rightarrow (n-2)(n+1) \Rightarrow n+2 \rightarrow$ [در اینجا] $\rightarrow n+1 \rightarrow$ [در اینجا]

ب) $m=2 \Rightarrow f: \{(-1,1), (2,2), (3,3), (n+2,n), (2,2)\}$
 $\rightarrow a=1$ $\downarrow$ $(1,n) \Rightarrow n+2$



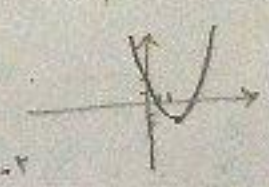
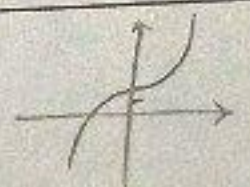
if $x \leq 1 \Rightarrow a+1$ در اینجا
 $a+1 \leq 2 \Rightarrow a \leq 1$



③ شیب در این قسمت ثابت است $a > 0$ ① if $x \leq 0 \Rightarrow a-1$ در اینجا
 $a-1 < 2 \Rightarrow a < 3$
 $\Rightarrow 0 < a < 3$

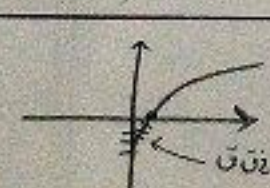
الف) $\begin{cases} y-2 = x_1^2 \\ y-2 = x_2^2 \end{cases} \Rightarrow x_1^2 = x_2^2 \Rightarrow x_1 = x_2$
 $\Rightarrow x = y^2 + 2 \rightarrow x-2 = y^2 \Rightarrow y = \sqrt{x-2}$

ب) $\min \left| \frac{y}{x-2} \right|$: است در اینجا



الف) $x = \frac{y+1}{y-2} \Rightarrow y = \frac{2x+1}{y-3}$

ب) $y = \frac{2(x+2)}{x+2} \Rightarrow$ [Graph of a horizontal line]



الف) $x = \sqrt{y-2} \rightarrow x^2 = |y-2|$
 $f(x)^{-1} = x^2 + 2 \quad x \geq 0$

ب) $y = x^2 - 6x + 7 \Rightarrow y = (x-3)^2 - 1$
 $x = (y+1)^2 - 1 \rightarrow x+1 = (y+1)^2 \Rightarrow f(x)^{-1} = \sqrt{x+1} + 1$
 $x \in [2, +\infty)$

$y = x + \sqrt{x} + \frac{1}{x} - \frac{1}{x} \Rightarrow y = (\sqrt{x} + \frac{1}{x})^2 - \frac{1}{x}$
 $x = (\sqrt{y} + \frac{1}{y})^2 - \frac{1}{y} \rightarrow \sqrt{x} + \frac{1}{x} = \sqrt{y} + \frac{1}{y} \Rightarrow y = (\sqrt{x+1} - \frac{1}{x})^2$
 $y = x + \frac{1}{x} + \frac{1}{x} - \sqrt{x+1} = x + \frac{1}{x} - \sqrt{x+1} \Rightarrow \begin{cases} a \leq 1 \\ b \leq \frac{1}{x} \\ c \leq -\frac{1}{x} \end{cases}$
 $\rightarrow 1 + 2(\frac{1}{x}) + 2(\frac{1}{x}) = 1$

بررسی می کنیم به ازای کدام مقدار x ...

$$f(x) = \frac{y}{1+|y|} \rightarrow \begin{cases} \frac{x}{x+1} & -1 < x < 0 \\ \frac{x}{x-1} & 0 \leq x < 1 \end{cases}$$

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

$$f\left(-\frac{2}{5}\right) + g^{-1}\left(-\frac{2}{5}\right) = \frac{-\frac{2}{5}}{-\frac{2}{5}+1} + \left(-\frac{2}{5} + \frac{4}{5}\right)^2 = -\frac{2}{5} + \frac{4}{5} = \frac{2}{5}$$

قرین ۸

$$y = \frac{x_1}{\sqrt{x_1^2 - 2}} \text{ و } y = \frac{x_2}{\sqrt{x_2^2 - 2}} \rightarrow \frac{x_1}{\sqrt{x_1^2 - 2}} = \frac{x_2}{\sqrt{x_2^2 - 2}}$$

$$\frac{x_1^2}{x_1^2 - 2} = \frac{x_2^2}{x_2^2 - 2} \Rightarrow \cancel{x_1^2 x_2^2} - 2x_1^2 = \cancel{x_1^2 x_2^2} - 2x_2^2 \Rightarrow x_1 = \pm x_2$$

پس y می تواند در x نقش اولویت نبوده و یک به یک است

$$x = \frac{y}{\sqrt{y^2 - 2}} \rightarrow x = \frac{y^2}{y^2 - 2} \rightarrow x^2 y^2 - 2x^2 = y^2 \Rightarrow y^2 = \frac{2x^2}{x^2 - 1}$$

$$y = \frac{\sqrt{2}x}{\sqrt{x^2 - 1}}$$

$$f^{-1}(x) = \sqrt[3]{x-1} \rightarrow x = \sqrt[3]{y-1} \rightarrow x^3 = y-1 \rightarrow y = x^3 + 1 \rightarrow f(x)$$

$$g(x) = x^3 + 1 + \sqrt{x^3 + 1} \rightarrow g(a) = 12 \rightarrow \sqrt{a^3 + 1} + \underbrace{1 + a^3}_{=12} = 12$$

جواب آخر $\leftarrow a = 2$

$$\Rightarrow t^3 + t - 12 = 0 \rightarrow t = 2 \text{ و } t = -6 \text{ و } t = 4$$

قرین ۱۰