

توانه طامعریان - یازدهم دضرت - کللیف سماره ۱۵

-۱

$$f = \{(\underbrace{3, 2}, \underbrace{n, a}, \underbrace{3, n^2 - n}, \underbrace{m, 2}, \underbrace{-1, 4})\}$$

$$n^2 - n = 2 \Rightarrow n^2 - n - 2 = 0 \Rightarrow (n - 2)(n + 1) = 0 \Rightarrow \begin{matrix} n = 2 \\ n = -1 \end{matrix}$$

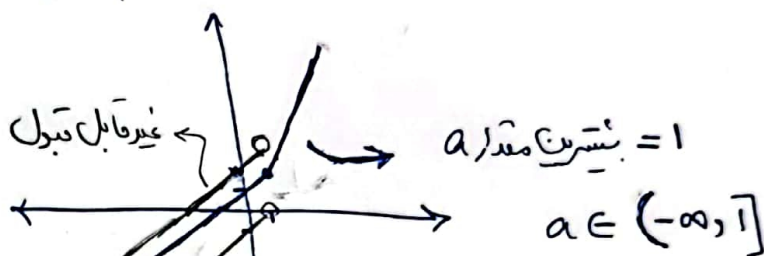
اگر $n = -1$ باشد $(-1, 4)$ و $(-1, a)$ را داریم پس قابل قبول نیست $\Leftarrow n = 2$

$$a = -1$$

$$f = \{(\underbrace{-1, 1}, \underbrace{1, 2}, \underbrace{2, 3}, \underbrace{a, m-1}, \underbrace{a+2, n}, \underbrace{m, 3})\}$$

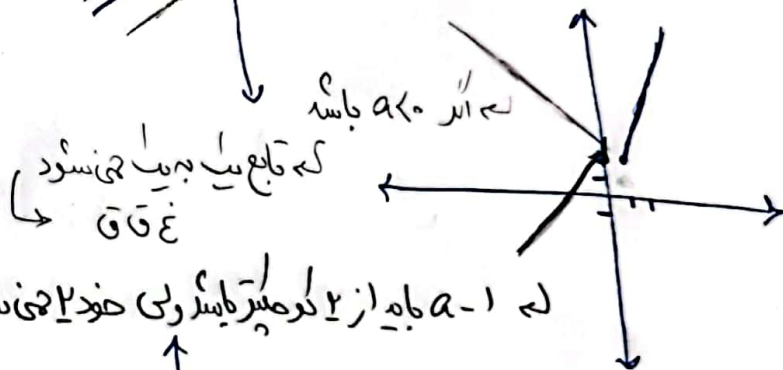
$m = 2$
 $n = 2$

$$f(x) = \begin{cases} 3x - 1 & ; x \geq 1 \\ x + a & ; x < 1 \end{cases}$$



$$f(x) = \begin{cases} 3x - 1 & ; x \geq 1 \\ ax + a - 1 & ; x < 0 \end{cases}$$

$a > 0$

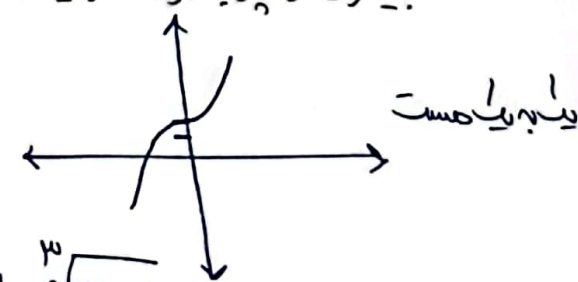


$$a - 1 < 2 \Rightarrow a < 3$$

$$a \in (0, 3)$$

$$y = x^3 + 2 \xrightarrow{\text{رسم شکل}}$$

که $a - 1$ به از ۲ کوچکتر باشد ولی خود ۲ نمی تواند باشد

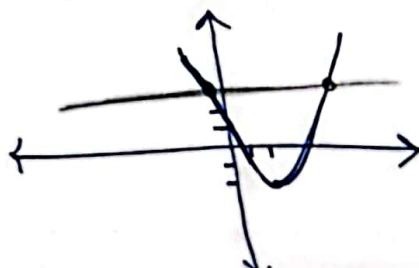


$$x = y^3 + 2 \Rightarrow y^3 = x - 2 \Rightarrow y = \sqrt[3]{x - 2}$$

$$y = x^2 - 4x + 2$$

$$\min \left| \frac{-b}{2a} = \frac{4}{2} = 2 \right|$$

$$4 - 1 + 2 = -2$$



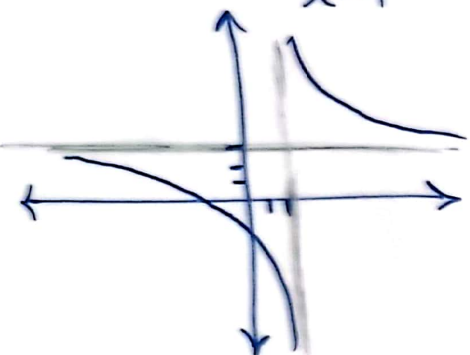
خفا موزی محور و ها آن را در دقت ملاحظه کنید

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

$(x-3)y = 2x+1$

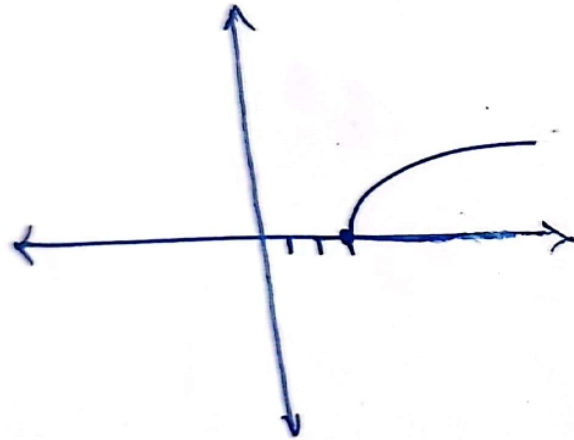
$y = \frac{2x+1}{x-3}$

مستقيم
است



ب) $y = \frac{2x+1}{x+3} = 2 \rightarrow$ تابع ثابت است $\rightarrow$ یک خط افقی است

الف) $y = \sqrt{x-10}$



ملاحظة:
المجال

$$x = \sqrt{y-10}$$

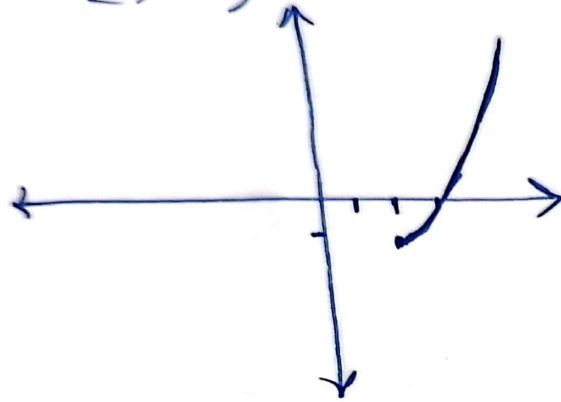
$$\xrightarrow{\text{تربيع الطرفين}} x^2 = y - 10$$

$$\Rightarrow y = x^2 + 10$$

-4

ب) $y = x^2 - \varepsilon x + \kappa \quad x \in [r, +\infty)$

$$\min \begin{cases} -\frac{b}{2a} = \frac{\kappa}{\varepsilon} = r \\ \kappa - r + \kappa = -1 \end{cases}$$



حالت $x = y^2 - \varepsilon y + \kappa$

$$\Rightarrow y^2 - \varepsilon y + \kappa - x = 0$$

$$y = \frac{\varepsilon \pm \sqrt{14 - \varepsilon(-x + \kappa)}}{\varepsilon}$$

$$= \frac{\kappa \pm \sqrt{\varepsilon x + \varepsilon}}{\varepsilon} = r \pm \sqrt{x+1}$$

دستوی تابع اول باید باشد تابع دوم برابر باشد $\Leftarrow r \pm \sqrt{x+1} \geq r \Leftarrow$ منفی غیر قابل قبول است $\Leftarrow$

$$y = r + \sqrt{x+1}$$

$$f(x) = x + \sqrt{x} \xrightarrow{f^{-1}(x)} x = y + \sqrt{y} + \frac{1}{\kappa} - \frac{1}{\kappa} = \left(\sqrt{y} + \frac{1}{\sqrt{\epsilon}}\right)^2 - \frac{1}{\epsilon} \Rightarrow x + \frac{1}{\epsilon} = \left(\sqrt{y} + \frac{1}{\sqrt{\epsilon}}\right)^2$$

$$\Rightarrow \sqrt{y} + \frac{1}{\sqrt{\epsilon}} = \sqrt{x + \frac{1}{\epsilon}} \Rightarrow \sqrt{y} = \sqrt{x + \frac{1}{\epsilon}} - \frac{1}{\sqrt{\epsilon}} \xrightarrow{\text{توان}} y = x + \frac{1}{\epsilon} + \frac{1}{\epsilon} - \sqrt{x + \frac{1}{\epsilon}}$$

$$a + \sqrt{b} + \kappa c = 1 + 1 - 1 = 1$$

$$= x - \sqrt{x + \frac{1}{\epsilon}} + \frac{1}{\sqrt{\epsilon}}$$

$$a=1 \quad b=\frac{1}{\sqrt{\epsilon}} \quad c=-\frac{1}{\sqrt{\epsilon}}$$

$$y = \frac{x}{\sqrt{x^2-2}} \rightarrow y = \frac{x_1}{\sqrt{x_1^2-2}} \quad \left. \begin{array}{l} y = \frac{x_2}{\sqrt{x_2^2-2}} \end{array} \right\} \Rightarrow \frac{x_1}{\sqrt{x_1^2-2}} = \frac{x_2}{\sqrt{x_2^2-2}} \xrightarrow{\text{مقادیر}} -1$$

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

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

y, x هم علامت اند پس
y فقط اند هر زمان

دو حالت مختلف داشته باشد $\Leftarrow \ominus$ غیر قابل قبول است $\Leftarrow x_1 = x_2 \Leftarrow$ تابع میانه پیدا است

$$x = \frac{y}{\sqrt{y^2-2}} \xrightarrow{\text{مقادیر}} x^2 = \frac{y^2}{y^2-2} \Rightarrow x^2 y^2 - 2x^2 = y^2 \Rightarrow (x^2-1)y^2 = 2x^2$$

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

از y, x هم علامت $\rightarrow y = \frac{x\sqrt{2}}{\sqrt{x^2-1}}$

$$f^{-1}(x) = \frac{x}{1+|x|} \quad g(x) = \sqrt{x}-1 \quad f\left(-\frac{r}{\omega}\right) + g^{-1}\left(-\frac{r}{\omega}\right) = -\frac{r}{\omega} + \frac{r}{r\omega} = -\frac{r\omega}{r\omega} \quad -9$$

$$x = \frac{y}{1+|y|} \Rightarrow x + |y|x = y \Rightarrow y - |y|x = x \xrightarrow{y \geq 0} y - yx = x$$

$$y = \frac{x}{x+1} \Leftrightarrow y(x+1) = x \Leftrightarrow y + yx = x \leftarrow y < 0 \quad \left. \begin{array}{l} y(1-x) = x \\ y = \frac{x}{1-x} \end{array} \right\}$$

$$f(x) \begin{cases} \frac{x}{1-x} & x \geq 0 \\ \frac{x}{x+1} & x < 0 \end{cases} \Rightarrow f\left(-\frac{r}{\omega}\right) = \frac{-\frac{r}{\omega}}{-\frac{r}{\omega}+1} = \frac{-\frac{r}{\omega}}{\frac{\omega-r}{\omega}} = -\frac{r}{\omega}$$

$$x = \sqrt{y} - 1 \Rightarrow \sqrt{y} = x+1 \Rightarrow y = (x+1)^2 \Rightarrow g^{-1}(x) = (x+1)^2 \Rightarrow g^{-1}\left(-\frac{r}{\omega}\right) = \left(\frac{\omega}{\omega}\right)^2 = \frac{\omega}{r\omega}$$

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

$$g^{-1}(14) = ? \quad \xrightarrow{\quad} x = \sqrt[3]{y-1} \quad \xrightarrow{\text{cube}} x^3 = y-1 \Rightarrow y = x^3 + 1$$

$$g(x) = x^3 + 1 + \sqrt{x^3 + 1}$$

$$g^{-1}(x) \rightarrow x = y^3 + 1 + \sqrt{y^3 + 1} \quad \sqrt{y^3 + 1} = t$$

$$x = t^3 + t \Rightarrow t^3 + t - x = 0$$

$$t = \frac{-1 \pm \sqrt{1 + 4x}}{2} \quad \xrightarrow{\quad} t = \frac{\sqrt{4x+1} - 1}{2} \Rightarrow$$

$$\sqrt{y^3 + 1} = \frac{\sqrt{4x+1} - 1}{2} \quad \xrightarrow{\text{square}} y^3 + 1 = \frac{4x+1+1-2\sqrt{4x+1}}{4}$$

$$y^3 + 1 = \frac{4x - \sqrt{4x+1} + 1}{4} \Rightarrow y^3 = \frac{4x - \sqrt{4x+1} - 1}{4}$$

$$\Rightarrow y = \sqrt[3]{\frac{4x - \sqrt{4x+1} - 1}{4}} \quad x=14 \rightarrow$$

$$g^{-1}(14) = \sqrt[3]{\frac{4 \cdot 14 - \sqrt{4 \cdot 14 + 1} - 1}{4}} = \sqrt[3]{\frac{4 \cdot 14 - 1 - 1}{4}} =$$

$$\sqrt[3]{\frac{14}{1}} = \sqrt[3]{14} = 14$$