

توانه طامعین - یازدهم دفتر - تکلیف شماره ۱۵

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

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

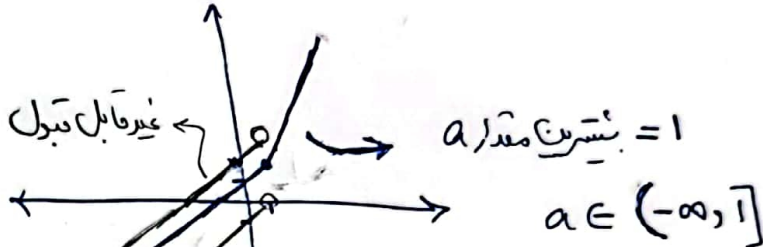
اگر $n=-1$ باشد $(-1, a)$ و $(-1, 2)$ را داریم پس قابل قبول نیست $\Leftarrow n=2$

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

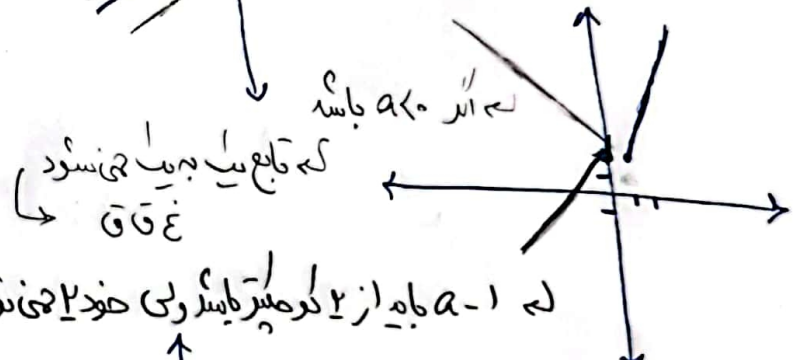
$a=-1$ $m=2$ $n=2$

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



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

$a > 0$



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

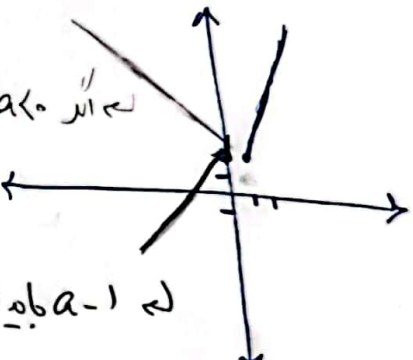
$a \in (0, 3)$

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

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$$y = x^3 + 2$$

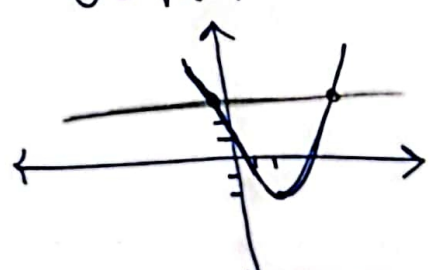
رسم شکل



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

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



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

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

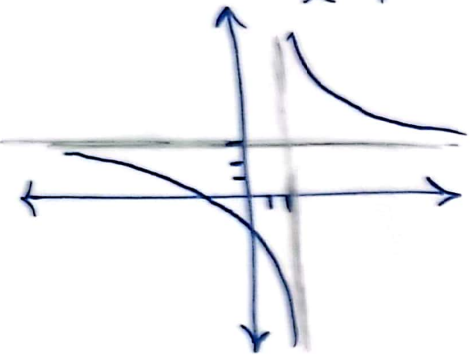
خفا موزی محور و ها آن را در دقیقه قطع می کند.

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

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

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

تابع
است

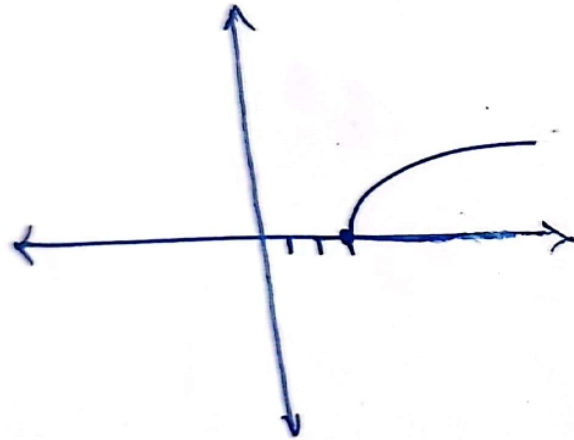


ب) $y = \frac{2x+1}{x+3} = 2 \rightarrow$ تابع ثابت است $\rightarrow$ $y = 2$ خط افقی است

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الف) $y = \sqrt{x-10}$



ملاحظة:
المجال

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

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

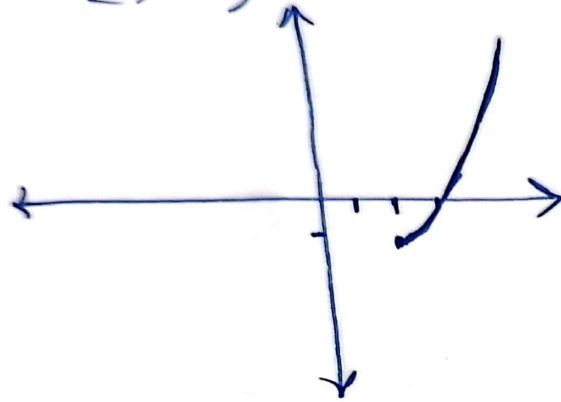
$$\Rightarrow y = x^2 + 10$$

-4

5

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

$$\min \left| \begin{array}{l} -\frac{b}{p_a} = \frac{\kappa}{p} = p \\ \kappa - 1 + p = -1 \end{array} \right.$$



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

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

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

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

دستوی تابع اول باید باشد تابع دوم برابر باشد $\Leftarrow p \pm \sqrt{x+1} \Leftarrow$ متقی غیرقابل قبول است $\Leftarrow$
 $y = p + \sqrt{x+1}$

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

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

$$a + rb + rc = 1 + 1 - 1 = 1$$

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

$$a=1 \quad b=\frac{1}{r} \quad c=-\frac{1}{\varepsilon}$$

✓

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

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

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

دو حالت ممکن است اندیش
ی می تواند هر دو

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

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

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

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

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

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

$$y = \frac{x}{x+1} \Leftrightarrow y(x+1) = x \Leftrightarrow y + yx = x \Leftrightarrow y < 0$$

$$y(1-x) = x$$

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

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

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

$$f^{-1}(x) = \sqrt[n]{x-1} \quad g(x) = f(x) + \sqrt{f(x)} \quad (5) \quad -1.$$

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

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

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

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

$$t = \frac{-1 \pm \sqrt{1 + 4x}}{2} \quad t > 0 \quad \rightarrow t = \frac{\sqrt{4x+1} - 1}{2} \Rightarrow$$

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

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

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

$$g^{-1}(14) = \sqrt[3]{\frac{4 \cdot 14 - \sqrt{4 \cdot 14 + 1} - 1}{4}} = \sqrt[3]{\frac{56 - \sqrt{57} - 1}{4}} =$$

$$\sqrt[3]{\frac{14}{4}} = \sqrt[3]{\frac{7}{2}} = \frac{\sqrt[3]{14}}{\sqrt[3]{2}} = \frac{\sqrt[3]{14}}{\sqrt[3]{2}}$$