

①

$$الف) f(x) = \left\{ (x, y), (n, y), (x, \frac{n^2 - n}{2}), (n, x), (-1, x) \right\}$$

$n = 2$

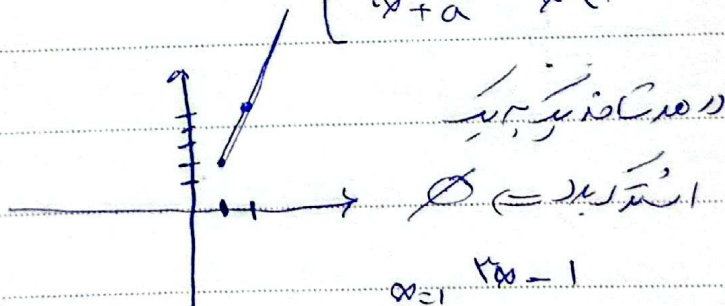
ب) $n^2 - n = 2 \Rightarrow n^2 - n - 2 = 0 \Rightarrow (n-2)(n+1) = 0$

$\boxed{n=2}$

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

$n=2 \quad a=-1 \quad \boxed{n=2}$

د) $f(x) = \begin{cases} x-1 & x \geq 1 \\ x+a & x < 1 \end{cases}$ ②



$$x+a < 2$$

$$\xrightarrow{x=1} 1+a < 2 \Rightarrow \boxed{a < 1}$$

$$\begin{aligned} x=1 & \Rightarrow x-1 = 0 \\ \Rightarrow y=2 \\ R &= [2, +\infty) \end{aligned}$$

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

ب) $R = [2, +\infty)$

$$a > 0$$

$$ax+a-1 < 2 \Rightarrow ax+a-1 < 2$$

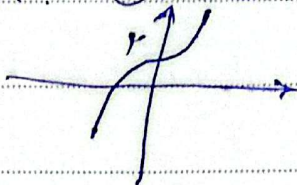
— Arman $\Rightarrow 0 < a < 3$

$$\boxed{a-1 < 2}$$

$$\boxed{a < 3}$$

یک به یک درون قدامت یک در صورت امکان ضمیمه می شود

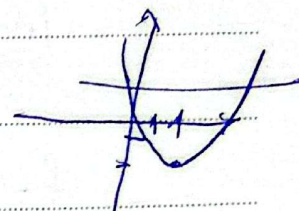
$y = x^2 + 2$ (الف)



✓
 $\Rightarrow x = y^2 + 2 \Rightarrow \sqrt{x-2} = y$

✓ / $y = x^2 - 2x + 2$

$\frac{-b}{2a} = \frac{2}{2} = 1$

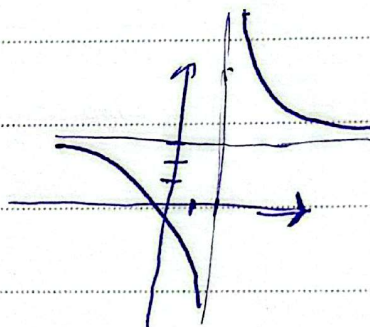


$4 - 4 + 2 = 2$

در این به یک به یک نمی توان مکتوب نمود

(الف) $y = \frac{x+1}{x-2}$
 معادله انت
 معادله
 قلم

نس



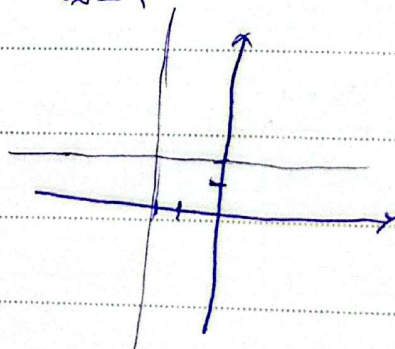
(ب)

✓ یک به یک
 هست

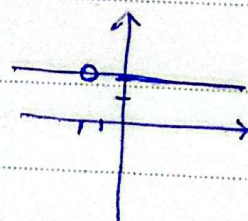
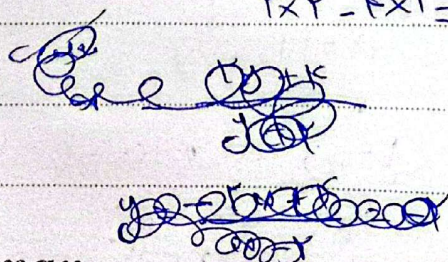
$2x(-2) - |x| = -4 < 0$

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

(ب) $y = \frac{x+2}{x-2} = 2$
 معادله
 معادله قلم



$2x2 - |x| = 0$



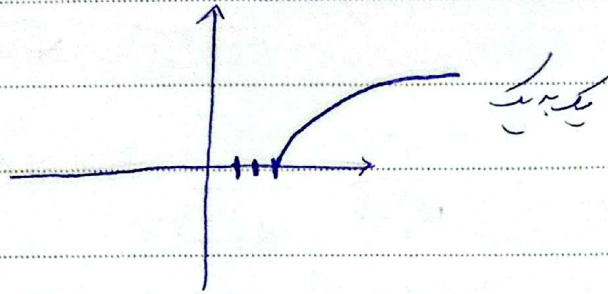
نس

یک به یک
 هست

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

$$x \in \mathbb{R} \Rightarrow R = [0, +\infty)$$

(4)



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

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

$$\text{المجال } D = [0, +\infty)$$

$$y = x^2 - 2x + 3 \quad x \in [1, +\infty)$$

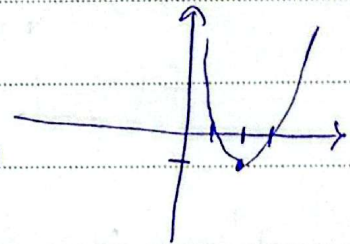
$$\frac{-b}{2a} = \frac{2}{2} = 1 \rightarrow (1)^2 - 2(1) + 3 = -1$$

$$1+x = y^2 - 2y + 3 + 1 \Rightarrow (y-2)^2 = x+1$$

$$y-2 = \sqrt{x+1}$$

$$\text{المجال } \Rightarrow y = \sqrt{x+1} + 2$$

$$\text{المجال } D = [-1, +\infty)$$



$$f(x) = x + \sqrt{x} \quad (0, +\infty)$$

④ دالة متزايدة

$$f'(x) = a x + b - \sqrt{x-c}$$

$$a = 1 \quad c = -\frac{1}{2}$$

$$b = \frac{1}{2}$$

$$\text{نريد } x = y + \sqrt{y} \Rightarrow \left(\sqrt{y} + \frac{1}{2}\right)^2 - \frac{1}{2} = x$$

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

— Arman —

$$a + b + c = 1 + \frac{1}{2} - \frac{1}{2} = 1$$

$$y = \frac{x}{\sqrt{x^2 - r}} \Rightarrow f(x_1) = f(x_2) \Rightarrow \frac{x_1}{\sqrt{x_1^2 - 1}} = \frac{x_2}{\sqrt{x_2^2 - 1}} \quad (1)$$

$$\frac{x_1^r}{x_1^r - 1} = \frac{x_2^r}{x_2^r - 1} \Rightarrow x_1^r (x_1^r - 1) = x_2^r (x_2^r - 1)$$

$$\Rightarrow x_1^r x_1^r - x_1^r = x_2^r x_2^r - x_2^r \Rightarrow x_1^r = x_2^r \Rightarrow x_1 = \pm x_2$$

نکته: اگر $x_1 = x_2$ و $y_1 = y_2$ باشد، آنگاه $f(x_1) = f(x_2)$ و $g(y_1) = g(y_2)$ است.

$$\text{در } y: x = \frac{y}{\sqrt{y^2 - r}} \Rightarrow x^r = \frac{y^r}{y^r - r} \Rightarrow y^r = \frac{+rx^r}{x^r - 1}$$

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

$$f\left(-\frac{r}{2}\right) + g^{-1}\left(-\frac{r}{2}\right) g(x) = \sqrt{x} - 1, \quad f^{-1}(x) = \frac{x}{1+|x|} \quad (2)$$

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

$$\Rightarrow \left(-\frac{r}{2} + 1\right)^r = \boxed{\frac{9}{4}}$$

$$f \Rightarrow x = \frac{y}{1+|y|}$$

$$\text{اگر } f \Rightarrow \text{اگر } f^{-1}$$

$$\frac{x}{1+|x|} = -\frac{r}{2}$$

$$\Rightarrow -r + -r|x| = 0$$

$$x < 0, \quad -r - rx = 0$$

$$-r = \sqrt{x} \Rightarrow x = -\frac{r}{v}$$

$$\frac{r}{\frac{9}{4}} - \frac{r}{\frac{9}{4}} = -\frac{r}{\sqrt{0}}$$

$$x < 0, \quad -r + rx = 0$$

$$-r = rx \Rightarrow x = -\frac{r}{r}$$

— Arman —

Q. Simplify

Subject: ()

Date:

Q. Let $g(x) = f(x) + \sqrt{f(x)}$ and $f^{-1}(x) = \sqrt{x-1}$ (10)

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

$g(x) = x^2 + 1 + \sqrt{x^2 + 1} = 12 \Rightarrow x^2 + 1 = 9 \Rightarrow x^2 = 8$

As $g^{-1} \Rightarrow$ by g

$x = 2$

$g^{-1}(12) = 2$