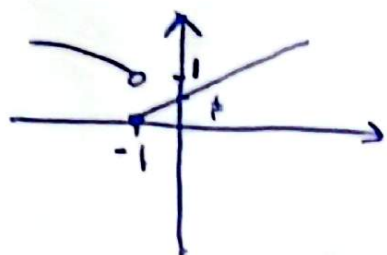


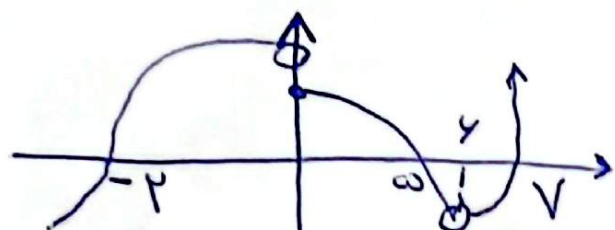
$$x = \begin{cases} 3y-1 & y \geq 0 \\ -y^2 & y > 1 \end{cases}$$

$$\Rightarrow y = \begin{cases} \frac{x+1}{3} & x \geq -1 \\ \sqrt{-x} & x < -1 \end{cases}$$

۱- (۲)



یا توجه به شکل تابع است ✓



f(x-2) ✓

۲- (۲)

x	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8
f(x-2)	-	-	0	+	+	+	+	0	-	0	-	0	+
f(x)	0	+	+	+	+	0	-	0	-	0	+	+	+
$\frac{x f(x-2)}{f(x)}$	0	+	0	-	0	+	-	0	-	0	-	0	+

$$D_f = [-4, -2] \cup [0, 3] \cup [7, +\infty) \quad \checkmark$$

فقط خواست باشد که $x=4$ در دامنه $f(x)$ و $x=4$ در دامنه $f(x-2)$ نیست که در بازه است آفده نیست.

$$x^2 - 4x = 0 \rightarrow (x)(x-4) = 0$$

(الف - ۳)

$$\rightarrow (x)(x-2)(x+2) = 0 \begin{cases} x \neq 0 \\ x \neq -2 \\ x \neq 2 \end{cases} \checkmark$$

$$D_f = \mathbb{R} - \{0, \pm 2\}$$

(۲)

$$2x^2 - 3x + 2 \rightarrow \Delta < 0 \rightarrow \checkmark \text{پیشندارد}$$

(۱)

$$\rightarrow x^2 - 4x > 0 \rightarrow (x)(x-4) > 0$$

$$\begin{array}{ccc} -2 & 0 & 2 \\ - & + & - & + \end{array}$$

$$\rightarrow D_f = (-2, 0) \cup (2, +\infty) \checkmark$$

(الف) $\frac{x-2}{x^2-2x-1} \geq 0 \rightarrow \frac{x-2}{(x^2-4)(x+2)} \geq 0$

-۲

$$\rightarrow \frac{x-2}{(x-2)(x+2)(x+2)} \geq 0 \quad \begin{array}{ccc} -2 & 2 & \\ - & + & - & + \end{array}$$

(۲)

$$D_f = (-2, +\infty) - \{2\} \checkmark$$

(ب) $4 - 2[-x] = 0 \rightarrow 2 = [-x] \rightarrow 2 \leq -x$

$$\rightarrow -2 \leq x \leq -4$$

~~$$D_f = \mathbb{R} - (-2, -4]$$~~

$$D_f = \mathbb{R} - (-2, -4] \checkmark$$

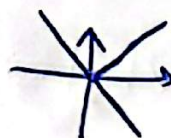
(الف) $(x)(x+1)(x-1) \geq 0$

$$D = [-1, 0] \cup [1, +\infty) \cup \{1\}$$

$$\begin{array}{ccc} -1 & 0 & 1 \\ - & + & - & + \end{array}$$

(۲) - ۱

$$|x| + x > 0 \rightarrow |x| > -x$$



$$\rightarrow x > 0 \rightarrow D = (0, +\infty) \cup \{1\}$$

$$D_f = \mathbb{I} \cap \mathbb{I} = [1, +\infty) \checkmark$$

$$\bullet) |x-y| - x^2 \geq 0$$

$$\rightarrow |x-y| \geq x^2$$

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

$$\rightarrow x^2 + x - y = 0$$

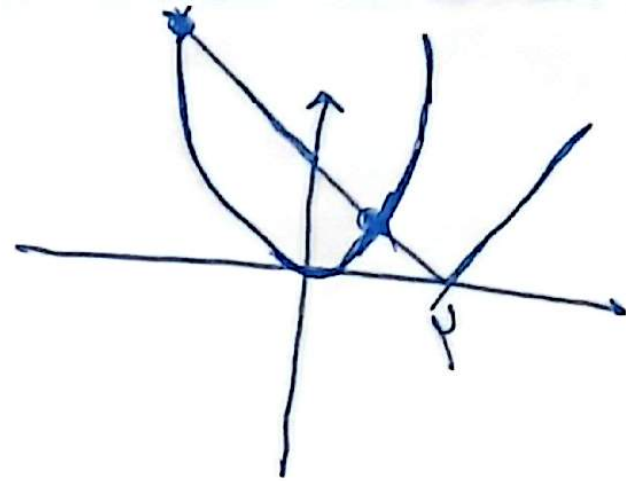
$$\rightarrow (x+y)(x-1) = 0 \begin{cases} \rightarrow x = -y \\ \rightarrow x = 1 \end{cases}$$

$$\rightarrow D = [-2, 1] \quad I$$

$$|x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1$$

$$D = \mathbb{R} - \{\pm 1\} \quad II$$

$$D_f = I \cap II \rightarrow [-2, 1) - \{-1\} \quad \checkmark$$



(c)

- 4

(r)

الف) $[x-2]=0 \rightarrow x-2 < 1 \rightarrow 1 < x < 3$

$$\begin{array}{c} \star \quad \mu \\ \hline + \quad \phi \quad 0 \quad + \quad + \end{array} \rightarrow D_f = \mathbb{R} \quad \checkmark$$

ب) $[x-\mu]=0 \rightarrow 0 < x-\mu < 1 \rightarrow \mu < x < \mu+1$

$|x-1| [x-\mu] \geq 0$

$$\begin{array}{c} 1 \quad \mu \quad \mu \\ \hline - \quad \phi \quad - \quad \phi \quad 0 \quad + \quad + \end{array}$$

$$D_f = [\mu, \mu+1) \cup \{1\} \quad \checkmark$$

$$|x - y| - 1 = k \quad \begin{cases} |x - y| = k + 1 \rightarrow \begin{cases} x = k + y \\ x = -k + y \end{cases} \\ |x - y| = -k + 1 \rightarrow \begin{cases} x = -k + y \\ x = k + y \end{cases} \end{cases}$$

✓ - ۲

$$-k + y = k + 1 \Rightarrow k = 1 \quad \checkmark$$

با استعاره کردن تساوی های متفاوت ←

$$x^2 + 3x + 2 = 0 \rightarrow (x+2)(x+1) = 0 \begin{cases} \rightarrow x = -1 \\ \rightarrow x = -2 \end{cases}$$

(۲) (۱)

$$\frac{x+1}{x-1} = 0 \rightarrow x = -1$$

$$x \neq -1, -2$$

$$x-1 = 0 \rightarrow x = 1$$

$$\Rightarrow n = 3 \checkmark$$

$$x^2 - 4x + 9 = 0 \rightarrow (x-3)^2 = 0 \Rightarrow x = 3 \checkmark \text{ یک ریشه دارد}$$

$$\left. \begin{aligned} x+1 > 0 &\rightarrow x > -1 \\ x+1 \neq 1 &\rightarrow x \neq 0 \end{aligned} \right\} \Rightarrow D = (-1, +\infty) - \{0\} \quad \text{--- 9}$$

(r)

~~$$\log x > 0$$~~

$$\log x^{-1} > 0 \rightarrow \log x < 0 \rightarrow \log \frac{x}{1} < 0$$

$$\log \frac{x}{1} < 0 \rightarrow x < 1 \quad \rightarrow \boxed{P_F = \{x \mid x < 1\} = (-\infty, 1)} \quad \checkmark$$

$$\log \frac{1}{x} < 0 \rightarrow x > 0 \quad \text{--- 10}$$

$x \neq 1$

$$-\infty < x < \infty \rightarrow 9 \leq x^2 \leq 25 \rightarrow \sqrt{9} \leq |x| \leq \sqrt{25}$$

--- 10

$$\rightarrow \sqrt{9} \leq |x| \leq \sqrt{25} \rightarrow D_F(x^2-1) = [3, 5] \cup [-5, -3] \quad \times$$

۱۰- دقتی معلوم دامنه $f(x)$ یعنی مقایسه که تابع f می تواند بگیرد پس $1 - x^{n^2}$ با n برابر $[-5, 3]$ قرار بگیرد:

$$-5 \leq x^{n^2-1} \leq 3 \rightarrow -4 \leq x^{n^2} \leq 4 \rightarrow x^{n^2} \leq 4 \rightarrow -\frac{4}{\sqrt{3}} \leq x \leq \frac{4}{\sqrt{3}}$$

$$\rightarrow -\frac{2\sqrt{3}}{3} \leq x \leq \frac{2\sqrt{3}}{3} \rightarrow D_f(x^{n^2-1}) = \left[-\frac{2\sqrt{3}}{3}, \frac{2\sqrt{3}}{3}\right]$$