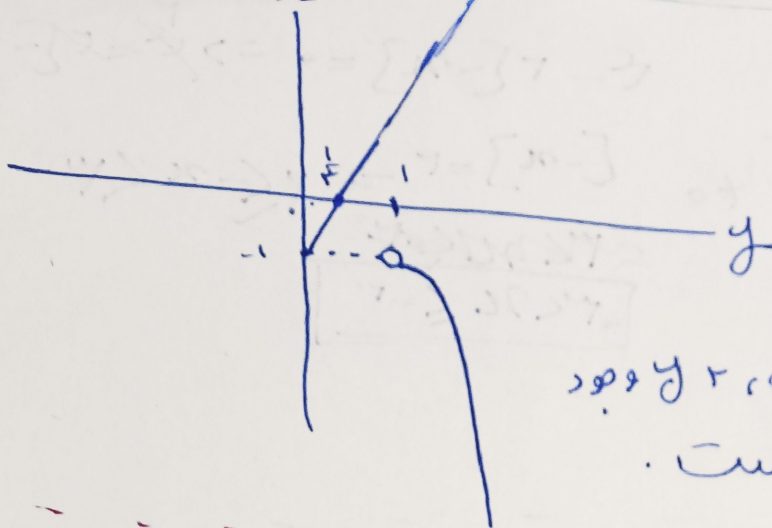


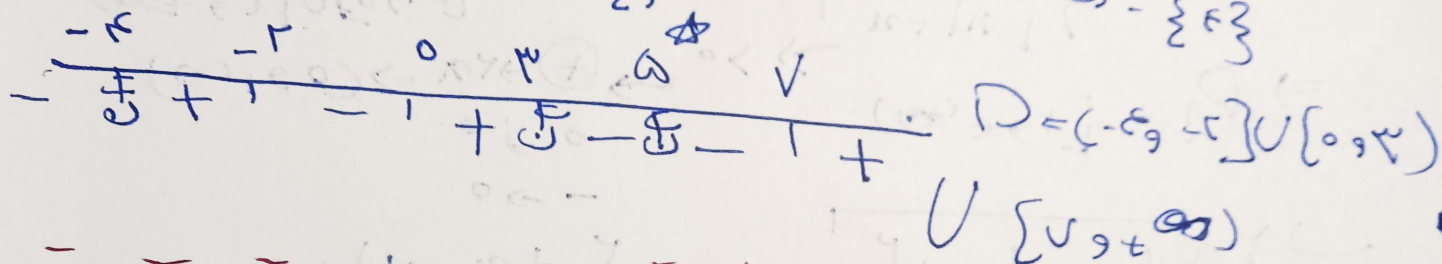
①



هنا عقالی
 تابع را بصورت $y = f(x)$ بنویسید
 و رسم می کنید:
 متوجه می شوید برای هر x و y وجود
 ندارد عبارت تابع است.

②

$x=0 \Rightarrow f(x-2) = -2, 0, 1 \Rightarrow f(x) = -4, 3, 0$
 $\hookrightarrow -\{4\} \quad \hookrightarrow -\{4\}$



③

$f(x) = \frac{2x^2 - 3x + 1}{x^3 - 5x} = \frac{(x-1)(2x-1)}{x(x-5)}$
 $x^3 - 5x = x(x-5)(x+5)$

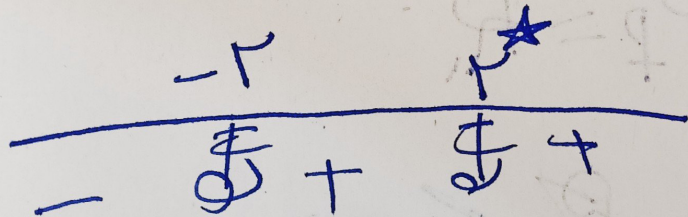
الف) $D = \{0, 5, -5\}$

ب) $\frac{2x^2 - 3x + 1}{x(x-5)(x+5)} \geq 0$
 $D = (-5, 0) \cup (1, 5) \cup (5, \infty)$

④

الف) $\frac{x-1}{x^4 - 2x^2 - 1}$

$\frac{x^4 - 2x^2 - 1}{x^4 - 2x^2 - 1} \geq 0 \Rightarrow x^4 - 2x^2 - 1 \geq 0$
 $(x^2 - 1)(x^2 + 1) \geq 0 \Rightarrow x^2 \geq 1 \Rightarrow x \leq -1 \text{ or } x \geq 1$



$x^2 = -1 \Rightarrow x = \pm i$
 $\Rightarrow x = \pm i$

$D = (-\infty, -1) \cup (1, \infty)$

$$\textcircled{3} \text{ ب) } \frac{n^2 + 1}{n^2 - n} \neq 0 \Rightarrow \frac{1}{n-1} = \frac{1}{n} \Rightarrow n = 1$$

$$D_f = \mathbb{R} \setminus \{1\}$$

$$\boxed{-1 < n < 1}$$

$$D_f = \mathbb{R} \setminus (-1, 1)$$

$\textcircled{4}$

$$\text{الف) } \sqrt{n(n-1)(n+1)} \rightarrow \infty$$

$$D_f =$$

$$\sqrt{|n| + n} \rightarrow \infty$$

$$\Rightarrow D_f = [1, \infty)$$

$$\begin{aligned} + &\rightarrow \infty \Rightarrow (0, \infty) \\ 0 &\rightarrow 0 \\ - &\rightarrow 0 \end{aligned}$$

$$\frac{-1 \quad 0 \quad 1}{+ \quad + \quad +} \\ [-1, 0] \cup [1, \infty)$$

$$\text{ب) } \sqrt{|n-1| - n^2}$$

$$-n^2 + |n-1| > 0$$

$$\star \quad \frac{1}{n}$$

$$-n^2 - n + 1 > 0 \quad -n^2 + n - 1 > 0$$

$$\begin{aligned} n^2 + n - 1 &\neq 0 \\ (n+1)(n-1) &\neq 0 \end{aligned}$$

$$n^2 - n + 1 \neq 0$$

$$D_f = \mathbb{R} \setminus \{1, -1\}$$

$$|n| \neq 1 \quad n \neq \pm 1$$

$$\frac{-1 \quad 1}{+ \quad - \quad +}$$

$$\star \rightarrow [-1, 1] \cup \text{all reals}$$

$$D_f = [-1, 1] \setminus \{1\}$$

$\textcircled{5}$

$$\text{الف) } \frac{1}{n^2 + 1}$$

$$D_f = \mathbb{R}$$

$$\text{ب) } \frac{1}{n^2 + 1}$$

$$D_f = \mathbb{R} \setminus (1, \infty) \cup \{1\}$$

$$\textcircled{V} \quad |n-r|-1=K \rightarrow \begin{cases} n-r=K+1 \rightarrow n=K+r \\ n-r=-K-1 \rightarrow n=-K+1 \end{cases}$$

$$|n-r|-1=-K \rightarrow + \rightarrow \{n-r\}=$$

$$\textcircled{V} \quad |n-r|-1=K \rightarrow \begin{cases} n-r=K+1 \rightarrow n=K+r \rightarrow n=r \\ n-r=K-1 \rightarrow n=-K+1 \rightarrow n=0 \end{cases}$$

$$\{n-r|-1=-K \rightarrow \begin{cases} n-r=-K+1 \rightarrow n=-K+r \rightarrow n=r \\ n-r=K-1 \rightarrow n=K+1 \rightarrow n=r \end{cases}$$

$$\rightarrow |n-r|=K+1 \rightarrow K+1 > 0 \rightarrow K > -1$$

$$|n-r|=-K+1 \rightarrow -K+1 > 0 \quad K < 1$$

$$-1 \leq K \leq 1$$

$$\rightarrow |n-r|-1=K \xrightarrow{\text{نیز است}} K > 0 \Rightarrow \boxed{K=1} \checkmark$$

$$f(n) = \frac{n^r + r n^{r-1}}{n^r + r n^{r-1}} \rightarrow (n+r)(n+r) \neq 0 \Rightarrow n \neq -1, -r$$

$$\begin{cases} n+1 \neq 0 \\ n-1 \neq 0 \end{cases} \rightarrow \begin{cases} n \neq -1 \\ n \neq 1 \end{cases} \Rightarrow n=r$$

$$n^r - r n^{r-1} = 0 \quad (n-r)^r = 0$$

$$\boxed{n=r}$$

$$\log \frac{1}{n^r} \rightarrow n \neq 1, n > 0$$

$$\frac{1}{n+1} \rightarrow n \neq 0, n > 0$$

$$\lim_{n \rightarrow \infty} \frac{1}{n^r} > 0 \rightarrow \frac{1}{n^r} > 0 \rightarrow \frac{1}{r} > 0 \Rightarrow r < 0$$

$$\Rightarrow D_f = (0, 1) \quad \text{if } 0 < n < 1$$

10) $f(x) = \frac{\sqrt{-(x+5)(x-3)}}{x^2-1}$ مفادع

$\frac{-\sqrt{3}}{2} \quad \frac{\sqrt{3}}{2}$
 $\Rightarrow D_f = \left[-\frac{\sqrt{3}}{2}, \frac{\sqrt{3}}{2} \right]$

1

برای سوال 1 یک اوش مرسوسه:

$x \begin{cases} y-1 \\ -y^2 \end{cases} \quad y \geq 0 \rightarrow y-1 = x \rightarrow y = \frac{x+1}{2}$

$y \geq 0 \rightarrow x \geq -1$

$-y^2 = x \rightarrow y = \pm \sqrt{-x}$

$y \geq 1 \rightarrow x \leq -1$

✓ تابع مست

