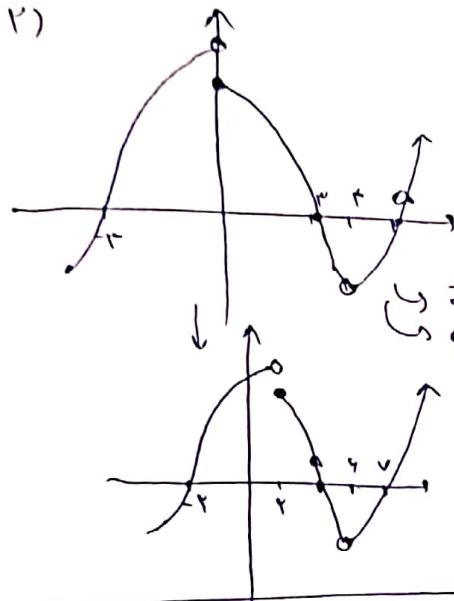
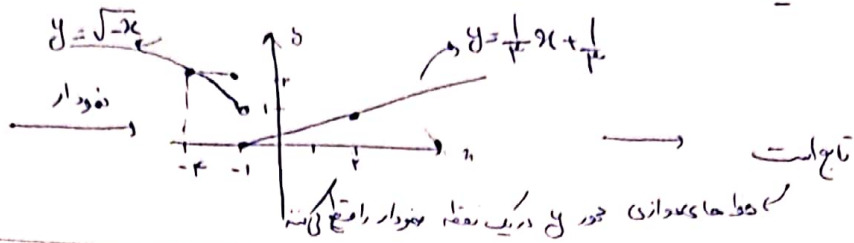
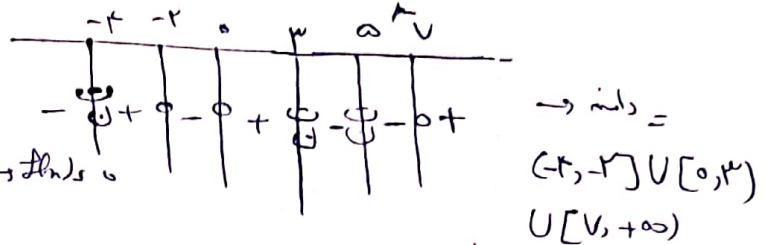


$$1) \quad x = \begin{cases} 3y-1 & y \geq 0 \\ -y^2 & y < 0 \end{cases}$$



$$g(x) = \sqrt{\frac{x f(x-2)}{f(x)}} \rightarrow \frac{x (f(x-2))}{f(x)} \geq 0$$



$$2) \quad f(x) = \frac{2x^2 - 3x + 1}{x^3 - 4x}$$

الف) $2x^2 - 3x + 1 \neq 0 \rightarrow x(2x-1)(x-1) \neq 0 \rightarrow x \neq 0, 1/2, 1 \rightarrow D_f = \mathbb{R} - \{0, 1/2, 1\}$

ب) $\sqrt{\frac{2x^2 - 3x + 1}{x^3 - 4x}} \geq 0 \rightarrow \frac{2x^2 - 3x + 1}{x^3 - 4x} \geq 0 \rightarrow \frac{-1}{x} + \frac{1}{x-1} + \frac{1}{x-2} \geq 0$

$D_f = (-2, 0) \cup (1, +\infty)$

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

$(x-2)(x+1)(x-1)(x+1) \geq 0$

$D = (-2, 2) \cup (2, +\infty)$

ب) $y = \frac{2x^2 + 1}{x^2 - 2[-x]} \rightarrow x^2 - 2[-x] \neq 0 \rightarrow x^2 + 2x \neq 0$

$x \neq 0, -2$

ج) $-x \geq 2 \rightarrow [-x] = 2 \rightarrow x \leq -2$

$D = \mathbb{R} - (-2, 2)$

8)

$$a) f(x) = \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}}$$

$$\begin{cases} x(x^2-1) \geq 0 \rightarrow \frac{-1}{-1+1-1} \rightarrow D = [-1, 0] \cup [1, +\infty) \\ |x|+x > 0 \rightarrow |x| > -x \rightarrow D = (0, +\infty) \end{cases}$$

$$\xrightarrow{\cap} D_f = [1, +\infty)$$

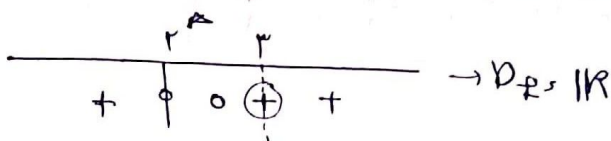
$$b) f(x) = \frac{\sqrt{|x-1|-x^2}}{|x|-1}$$

$$\begin{cases} |x-1|-x^2 \geq 0 \rightarrow \begin{cases} x > 1 & -x^2+x-1 \geq 0 \rightarrow \Delta < 0 \rightarrow \text{no solution} \\ x < 1 & -x^2-x+1 \geq 0 \rightarrow 0 \geq x^2+x-1 \rightarrow \frac{-1 \pm \sqrt{5}}{2} \end{cases} \\ |x| \neq 1 \rightarrow x \neq \pm 1 \end{cases}$$

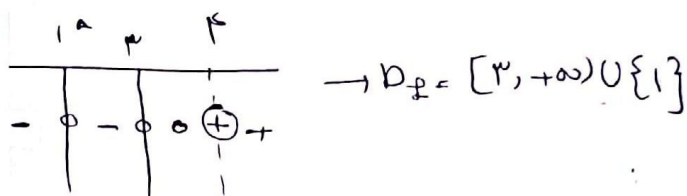
$$\xrightarrow{\cap} D_f = [-1, 1) \setminus \{-1\}$$

9)

$$a) y = \sqrt{(x-2)(x-7)} \quad (x-2)(x-7) \geq 0$$



$$b) y = \sqrt{|x-1|(x-3)} \quad |x-1|(x-3) \geq 0$$

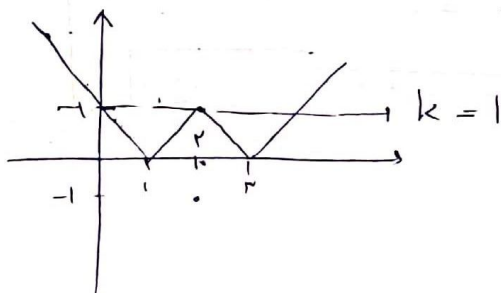


10)

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

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

نقطه تقاطع $|x-1|-1$ و $y=k$ را پیدا کنید



11)

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

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

مخرج را
پیدا کنید

$$x \neq -1$$

$$x^2 - 1x^2x + 1x^2 = 0 \rightarrow x^2 - 9x + 9 = 0 \rightarrow (x-3)^2 = 0 \rightarrow x = 3$$

نقطه تقاطع را پیدا کنید

$$9) \quad y = \log_{x+1} \log_n \frac{1}{x} \quad \left\{ \begin{array}{l} x > 0, x \neq 1 \\ \log_n \frac{1}{x} > 0 \rightarrow \frac{1}{x} < 1 \rightarrow x < 1 \\ x+1 > 0 \rightarrow x > -1 \\ x+1 \neq 1 \rightarrow x \neq 0 \end{array} \right. \rightarrow D_f = (0, 1)$$

10)

$$D_{f(x)} = [-\omega, \pi]$$

$$f(x) = \log(x^2 - 1)$$

$$\begin{aligned} x^2 - 1 > -\omega &\rightarrow x^2 > -\omega \\ \frac{x}{\pi} > x^2 &\rightarrow \frac{x\sqrt{\pi}}{\pi} > x > \frac{-x\sqrt{\pi}}{\pi} \end{aligned}$$

$$D_{f(x)} = \left[-\frac{x\sqrt{\pi}}{\pi}, \frac{x\sqrt{\pi}}{\pi} \right]$$