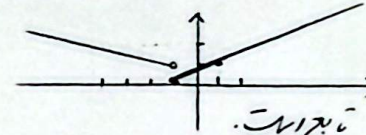
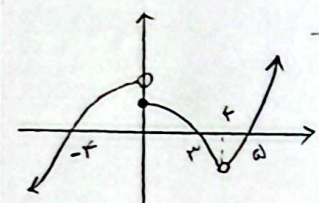


1 $x \in \begin{cases} 4y-1 & y \geq 0 \\ -y^2 & y > 1 \end{cases} \rightarrow (y \geq 0) \wedge x \leq 4y-1 \Rightarrow \frac{x+1}{4} \leq y$
 $\rightarrow (y > 1) \wedge x \leq -y^2 \Rightarrow y \leq \pm \sqrt{-x} \Rightarrow y \leq \sqrt{-x}$


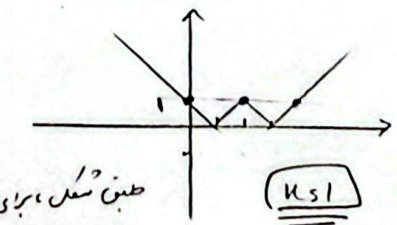
2 
 $f(x) = (x+4)(x+2)(x-3)(x-5)$
 $f(x-2) = (x+2)(x)(x-5)(x-7)$
 $x = 0$
 $D = (-4, -2) \cup (0, 3) \cup (5, +\infty)$

3 $\Delta = 4 - 4 \times 2 \times 2 = -12 < 0$ (ب) $D_f \subset \mathbb{R} - \{\pm 2, 0\}$
 $x(x-2)(x+2)$ $\frac{-2 \ 0 \ 2}{- \oplus + \oplus - \oplus +}$ (ب) $(-2, 0) \cup (2, +\infty)$

4 (الف) $\frac{x-2}{(x^2-4)(x^2+2)} = \frac{x-2}{(x-2)(x+2)(x^2+2)}$ $\frac{-2 \ 0 \ 2}{- \oplus + \oplus +}$ $D = (-2, +\infty) - \{2\}$
 (ب) $4-2[-x] \neq 0 \Rightarrow [-x] \neq 2 \Rightarrow x \neq [-2, -2] \Rightarrow \mathbb{R} - (-2, -2]$

5 (الف) $x(x-1)(x+1) \geq 0 \Rightarrow [1, +\infty)$
 (ب) $|x-2| - x^2 \geq 0 \Rightarrow |x-2| \geq x^2$
 $x-2 \geq x^2 \Rightarrow x^2-x+2 \leq 0$
 $x-2 \leq -x^2 \Rightarrow x^2+x-2 \leq 0 \Rightarrow (x+2)(x-1) \leq 0$
 $D = (-\infty, -2] \cup (1, +\infty)$

6 (الف) $(x-2)[x-2] \geq 0 \Rightarrow x \leq 2$
 (ب) $|x-1|[x-2] \geq 0 \Rightarrow x \leq 1$
 $D_f \subset \mathbb{R}$
 $D_f \subset [2, +\infty) \cup \{1\}$

7 $|x-2|-1 = k$
 $|x-2|-1 = k \Rightarrow |x-2| = k+1$
 $k \in (0, 1]$


8 $\frac{x^2+4x+2}{x^2+4x+2} \rightarrow (x+2)(x+1) \neq 0 \Rightarrow x \neq \{-2, -1\}$
 $\frac{x+1}{x-1} \rightarrow x+1 \neq 0 \Rightarrow x \neq -1$
 $x-1 \rightarrow x-1 \neq 0 \Rightarrow x \neq 1$
 $\Rightarrow x \in \mathbb{R} - \{-2, \pm 1\}$
 $\Rightarrow x^2-4x+9 \geq 0 \Rightarrow (x-2)^2 \geq -5$

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$$\left\{ \begin{array}{l} x > 0, x \neq 1 \\ x+1 > 0 \rightarrow x > -1 \\ x+1 \neq 1 \rightarrow x \neq 0 \end{array} \right\} \rightarrow (0, +\infty) - \{1\}$$

(ادرس) D_f

$\log_{\frac{1}{2}} x > 0 \rightarrow \frac{1}{2} > x^2 \rightarrow \frac{1}{4} > x$ برای اعداد مثبت $\rightarrow 0 < x < \frac{1}{4}$ تغییر جهت

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طبق دایره

$$-5 \leq x \leq 2 \rightarrow 0 \leq x^2 \leq 25 \rightarrow 0 \leq \cos x \leq 5 \rightarrow -1 \leq \cos^2 x - 1 \leq 4 \rightarrow D_f: [-1, 4]$$