

الف)  $\frac{x+3}{2x^2+3x^2-1x+3} = \frac{(x+3)}{(x-1)(2x^2+5x-3)}$   $\Rightarrow D_f = \mathbb{R} - \left\{ -\frac{1}{2}, 1 \right\}$

جمع فویل منفرجه  $\rightarrow x^2+5x-6 = (x+6)(x-1)$

ب)  $\frac{x+3}{2x^2+9x^2+1x+3} = \frac{x+3}{(x+1)(2x^2+7x+3)}$   $\Rightarrow D_f = \mathbb{R} - \left\{ -\frac{1}{2}, -1 \right\}$

جمع فویل منفرجه  $\rightarrow x^2+7x+3 = (x+4)(x+1)$   $\Rightarrow x = -\frac{7}{2}, -1$

الف)  $\frac{x+3}{x^3-2x^2+2x-1} = \frac{x-3}{(x-1)(x^2-x+1)}$   $\Rightarrow D_f = \mathbb{R} - \{1\}$

ب)  $\sqrt{\frac{x+3}{x^3-2x^2+2x-1}} = \frac{x-3}{(x-1)(x^2-x+1)}$   $\Rightarrow D_f = (-\infty, 1) \cup (1, +\infty)$

$x^2 - 5|x-1| - 2x + 6 \neq 0$

$\left\{ \begin{array}{l} x^2+5x-6-2x+6 \geq 0 \Rightarrow x^2+3x \geq 0 \Rightarrow x(x+3) \geq 0 \Rightarrow x \leq -3 \text{ or } x \geq 0 \\ x^2-5x+6-2x+6 < 0 \Rightarrow x^2-7x+12 < 0 \Rightarrow (x-3)(x-4) < 0 \Rightarrow 3 < x < 4 \end{array} \right.$

$\Rightarrow D_f = \mathbb{R} - \{0, 3, 4\}$

الف)  $|2x+1| - |x+3| \neq 0$

$\left\{ \begin{array}{l} -2x-1-x-3 < 0 \Rightarrow -3x-4 < 0 \Rightarrow x > -\frac{4}{3} \\ -2x-1-x+3 > 0 \Rightarrow -3x+2 > 0 \Rightarrow x < \frac{2}{3} \end{array} \right.$

ب)  $\sqrt{|2x+1| - |x+3|} \geq 0$

$\Rightarrow |2x+1| \geq |x+3| \Rightarrow \begin{cases} 2x+1 \geq x+3 \Rightarrow x \geq 2 \\ 2x+1 \leq -x-3 \Rightarrow 3x \leq -4 \Rightarrow x \leq -\frac{4}{3} \end{cases}$

$\Rightarrow D_f = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$

الف)  $g = \log_2(1 - \log_3^x)$

$\begin{cases} x > 0 \\ 1 - \log_3^x > 0 \Rightarrow \log_3^x < 1 \Rightarrow x < 3 \end{cases}$

$D_f = (0, 3)$

ب)  $g = \log_2(1 - \log_{\frac{1}{3}}^x)$

$\begin{cases} x > 0 \\ 1 - \log_{\frac{1}{3}}^x > 0 \Rightarrow \log_{\frac{1}{3}}^x < 1 \Rightarrow x > \frac{1}{3} \end{cases}$

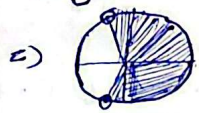
$\Rightarrow D_f = (\frac{1}{3}, +\infty)$

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

$$\begin{cases} 2^x - 1 > 0 \Rightarrow x > \frac{1}{f} \\ \log_{\frac{1}{2}} (2^x - 1) > 0 \Rightarrow 2^x - 1 > 1 \Rightarrow 2^x > 2 \Rightarrow x > 1 \\ \log_{\frac{1}{2}} \log_{\frac{1}{2}} (2^x - 1) \geq 0 \Rightarrow \log_{\frac{1}{2}} (2^x - 1) \leq 1 \Rightarrow (2^x - 1) \leq 2 \\ \Rightarrow 2^x \leq 3 \Rightarrow x \leq \log_2 3 \end{cases} \Rightarrow D_f = (1, \log_2 3]$$

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الف)  $\log_2 (2 \cos x + 1) \geq 0 \Rightarrow 2 \cos x + 1 > 0 \Rightarrow 2 \cos x > -1 \Rightarrow \cos x > -\frac{1}{2}$



$$\Rightarrow D_f = (2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3})$$

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ب)  $\sqrt{\log_{\frac{x-1}{x+1}}}$   $\Rightarrow \frac{x-1}{x+1} > 0 \Rightarrow \frac{-1}{+} - \frac{1}{+} \Rightarrow D_f = (-\infty, -1) \cup (1, +\infty)$

$\log_{\frac{x-1}{x+1}} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1-x-1}{x+1} \geq 0 \Rightarrow \frac{-2}{x+1} \geq 0 \Rightarrow \frac{1}{+} - \frac{1}{+} \Rightarrow D_f = (-\infty, -1)$

$$f(x) = \sqrt{(a+x)^2 + ax + b}$$

چون در هر دو قسمت آن فرقی نیست  
باشند باید در دو بازه تعریف شود  
و اگر فرقی باشد باید بین ریشه آن فرقی  
شود و چون کمالات از این دو نسبت پس فرقی  
صفر است.

$$\Rightarrow -2x + b = 0 \xrightarrow{x=3} -6 + b = 0 \Rightarrow b = 6 \Rightarrow f(x) = -2x + 6$$

$$\Rightarrow \boxed{b = 6}$$

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$$f(x) = \sqrt{x^2 + 2x + (x-m)^2} \xrightarrow{D_f = R} \Delta \leq 0 \Rightarrow b^2 - 4ac \leq 0 \Rightarrow 4 - 4(1-m^2) \leq 0$$

$$\Rightarrow 4m^2 - 4 \leq 0 \Rightarrow (m^2 - 1) \leq 0$$

$$\frac{-1}{+} - \frac{1}{+} \Rightarrow -1 \leq m \leq 1$$

$$\Rightarrow \max x - \min x = 1 - (-1) = 2$$

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$$f(x) = \sqrt{\frac{4-x^2}{[x] + [-x] + 1}}$$

$$\begin{cases} 4-x^2 \geq 0 \Rightarrow \frac{-2}{-} - \frac{2}{-} \Rightarrow -2 \leq x \leq 2 \\ [x] + [-x] + 1 \neq 0 \end{cases}$$

چون علاوه شده پس برای اعداد  
غیر صحیح جواب صحیح شود. در رقم  
 $x = \pm 2$

$$\Rightarrow D_f = \{x \in \mathbb{Z} \mid -2 \leq x \leq 2\} \Rightarrow D_f = \{-2, -1, 0, 1, 2\}$$

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