

$x \leq y-1 \quad y \geq 0 \rightarrow x = y-1 \rightarrow y = \frac{x+1}{2} \quad \text{و} \quad y \geq 0$
 $-y^2 \quad y > 1 \rightarrow x = -y^2 \rightarrow y^2 = -x \rightarrow y = \pm \sqrt{-x} \quad \text{و} \quad y > 1$
 $x \leq 0$

 تابع هست

$\frac{x \cdot f(x-2)}{f(x)} \geq 0 \rightarrow -2, 0, \infty$
 $f(x) \rightarrow -\infty, 2, 0$

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

فقط دو حالت باشد که $x=4$ در دامنه f و $x=4$ در دامنه $f(x-2)$ است که در بازه مثبت آمده نیست

$f(x) = \frac{2x^2 - 3x + 2}{x^3 - 2x} = \frac{2x^2 - 3x + 2}{x(x-2)(x+2)} \rightarrow \Delta < 0 \text{ و } a > 0 \Rightarrow$ همیشه مثبت
 $\Rightarrow D \sqrt{f(x)} = x(x-2)(x+2) > 0 \Rightarrow \frac{-2}{-} + \frac{2}{+} + \frac{2}{+} \Rightarrow D = (-2, 0) \cup (2, +\infty)$

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

الف) $\frac{x-2}{x^4 - 2x^2 - 1} \geq 0 \rightarrow \frac{x-2}{x^2 - 2x - 1} \geq 0 \rightarrow \frac{(x-2)}{(x-2)(x+2)} \geq 0 \rightarrow \frac{x-2}{(x-2)(x+2)(x^2+2)} \geq 0$
 $\Rightarrow \frac{-2}{-} + \frac{2}{+} + \frac{2}{+} \Rightarrow D_f = (-2, 2) \cup (2, +\infty)$

ب) $\frac{2x^2+1}{x^2-2} \geq 0 \rightarrow x^2-2 \neq 0 \rightarrow x \neq \pm \sqrt{2} \rightarrow$
 $\rightarrow [x] \neq \sqrt{2} \rightarrow \sqrt{2} < x \rightarrow x > \sqrt{2} \Rightarrow D_f = \mathbb{R} - (-\sqrt{2}, \sqrt{2})$

الف) $x(x^2-1) \geq 0 \rightarrow x(x-1)(x+1) \geq 0 \Rightarrow \frac{-1}{-} + \frac{0}{+} + \frac{1}{+} \Rightarrow x > 0 \Rightarrow [1, +\infty)$
 $|x| + x > 0 \rightarrow |x| > -x$

 ب) $|x-2| - x^2 \geq 0 \rightarrow |x-2| \geq x^2$

 $|x|-1 \neq 0 \rightarrow x \neq \pm 1$
 $-x+2 = x^2 \rightarrow x^2+x-2 = (x+2)(x-1) = 0 \Rightarrow x = -2, 1$
 $\Rightarrow D_f = [-2, 1) - \{-1\}$

$$(x-2)[x-3] \geq 0$$

$$\begin{array}{c} 2 \quad 3 \\ + \quad | \quad + \\ \hline 0 \quad 0 \end{array} \Rightarrow D_f = \mathbb{R} \checkmark$$

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$$|x-1||x-3| \geq 0$$

$$\begin{array}{c} 3 \quad 4 \\ - \quad | \quad + \\ \hline 0 \quad 0 \end{array} \Rightarrow D = [3, +\infty) \cup \{1\}$$

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$D_f = [3, +\infty) \cup \{1\}$ ریشه داخل قه مطلق، عبارت را منفی می کند!

$$\frac{1}{|x-2|-1} - k \rightarrow \begin{cases} |x-2|-1 = k \rightarrow |x-2| = k+1 \\ |x-2|-1 = -k \rightarrow |x-2| = 1-k \end{cases}$$

روش معنی بعد هم بین

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$$\begin{aligned} \Rightarrow \begin{cases} x-2 = k+1 \rightarrow x = k+3 \\ 2-x = k+1 \rightarrow x = -k+1 \end{cases} & \quad -k+3 = k+1 \Rightarrow 2k = 2 \Rightarrow k = 1 \\ \Rightarrow \begin{cases} x-2 = 1-k \rightarrow x = -k+3 \\ 2-x = 1-k \rightarrow x = k+1 \end{cases} & \quad -k+1 = k+3 \Rightarrow k = -1 \end{aligned}$$

تنها 2 عبارت باید با هم برابر شوند 3 مقدار پیدا می شود.

$$\frac{x^2+3x+2}{x^2+3x+2} \Rightarrow \begin{cases} x^2+3x+2 = 0 \rightarrow (x+2)(x+1) = 0 \rightarrow x = -1, -2 \\ \frac{x+1}{x-1} = 0 \rightarrow x = -1 \\ x-1 = 0 \rightarrow x = 1 \end{cases} \Rightarrow \boxed{x = 3} \checkmark$$

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$$x^2 - 2(3)x + 3(3) = 0 \rightarrow x^2 - 4x + 9 = (x-3)^2 = 0 \rightarrow x = 3$$

ریشه مضاعف دارد.

$$y = g_{n+1} \left(g_n \frac{1}{x} \right) \rightarrow \begin{cases} g_n \frac{1}{x} > 0 \rightarrow \begin{cases} n > 0, n \neq 1 \\ \frac{1}{x} < 1 \end{cases} \\ n+1 > 0 \rightarrow n > -1 \\ n+1 \neq 1 \rightarrow n \neq 0 \end{cases}$$

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$$D_g = (0, +\infty) \setminus \{1\}$$

$$D_f = [-6, 3]$$

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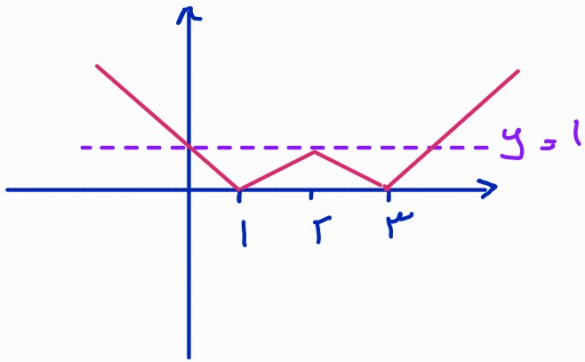
$$\begin{aligned} D_f(3x^2-1) = \mathbb{R} & \rightarrow -8 \leq 3x^2-1 \leq 3 \rightarrow -7 \leq 3x^2 \leq 4 \rightarrow -\frac{7}{3} \leq x^2 \leq \frac{4}{3} \\ \Rightarrow 0 \leq x^2 \leq \frac{4}{3} & \Rightarrow |x| \leq \sqrt{\frac{4}{3}} \Rightarrow \boxed{-\frac{2\sqrt{3}}{3} \leq x \leq \frac{2\sqrt{3}}{3}} \\ D_f & = \left[-\frac{2\sqrt{3}}{3}, \frac{2\sqrt{3}}{3} \right] \checkmark \end{aligned}$$

$$||x-2|-1| = k \rightarrow \text{۳ ریشه دارد}$$

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شکل تابع را با خط قطع مردهم:

چون ۳ نقطه برخورد دارند پس $k=1$ بوره!



$$1) x+1 > 0 \rightarrow x > -1, \text{ و } x+1 \neq 1 \rightarrow x \neq 0$$

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$$2) x > 0 \text{ و } x \neq 1$$

$$\xrightarrow{x} D_f = (0, 1)$$

$$3) \lg \frac{1}{x} > 0 \rightarrow 0 < x < 1$$