

(الف) $n-1$ بین ضرب است $\rightarrow$ جمع ضرایب درج ضرایب

$$\begin{array}{r} 5x^3 - 4x^2 + 3x - 15 \quad | x-1 \\ -(5x^3 - 5x^2) \\ \hline 9x^2 + 3x - 15 \\ - (9x^2 - 9x) \\ \hline 12x - 15 \\ - (12x - 12) \\ \hline 3 \end{array}$$

$$5x^3 - 14x + 15 = 0 \rightarrow (x-1)(x-9) = 0$$

$$\rightarrow \begin{cases} x = 1 \\ x = 9 \end{cases}$$

بسیجی $\rightarrow$ $\frac{1}{4}, \frac{3}{4}, 1$

$$D_f = R - \left\{1, \frac{3}{4}, \frac{1}{4}\right\}$$

(ب) درج ضرایب توان های زوج برابر ضرایب توان های فرد است

$$\begin{array}{r} 2x^3 - x^2 - 11x - 6 \quad | x+1 \\ -(2x^3 + 2x^2) \\ \hline -3x^2 - 11x - 6 \\ - (-3x^2 - 3x) \\ \hline -8x - 6 \\ - (-8x - 8) \\ \hline 2 \end{array}$$

$$2x^3 - 4x^2 - 6x = 0 \rightarrow x^2 - 4x - 3 = 0$$

$$(x-4)(x+3) = 0$$

$$\rightarrow \begin{cases} x = \frac{4}{3} \\ x = -3 \end{cases}$$

بسیجی $\rightarrow$ $-1, -\frac{3}{4}, 2$

$$D_f = R - \left\{-1, -\frac{3}{4}, 2\right\}$$

(الف) $\frac{n+1}{n-\sqrt{2}-2n} \rightarrow 3-2n, 0 \rightarrow n \leq \frac{3}{2}$

$$n - \sqrt{2}-2n \neq 0 \rightarrow n^2 + 2n - 3 \neq 0 \rightarrow (n+3)(n-1) \neq 0 \rightarrow n \neq -3, n \neq 1$$

$$n \neq \sqrt{2}-2n$$

$$D_f = (-\infty, \frac{3}{2}] - \{1\}$$

(ب) $\frac{n+2}{n-\sqrt{2}-2n} \rightarrow 3n-2, 0 \rightarrow n \geq \frac{2}{3}$

$$n - \sqrt{2}-2n \neq 0 \rightarrow n^2 - 3n + 2 \neq 0 \rightarrow (n-1)(n-2) \neq 0 \rightarrow n \neq 1, n \neq 2$$

$$n \neq \sqrt{2}-2n$$

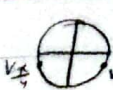
$$D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$$

(الف) $1 \cos n - 1 \neq 0 \rightarrow \cos n \neq \frac{1}{4}$



$$D_f = R - \left\{2k\pi + \frac{\pi}{4}, 2k\pi + \frac{7\pi}{4}\right\}$$

(ب) $1 \sin n + 1 \neq 0 \rightarrow \sin n \neq -\frac{1}{4}$



$$D_f = R - \left\{2k\pi + \frac{7\pi}{4}, 2k\pi + \frac{11\pi}{4}\right\}$$

(ج) $C_6 n = \frac{\cos n}{\sin n} \rightarrow \sin n \neq 0$



$$\tan n = \frac{\sin n}{\cos n} \rightarrow \cos n \neq 0$$



$$\cot n = 1 \neq 0 \rightarrow \cot n \neq 1$$



$$D_f = R - \left\{k\pi, k\pi + \frac{\pi}{4}\right\}$$

ج) $\sin^2 x - 3 \neq 0 \rightarrow \sin^2 x \neq \frac{3}{4} \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{2}$
 $D_f = \mathbb{R} - \left\{ x \mid x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$



الف) $x^2 - 4x + 4 > 0 \rightarrow (x-2)(x-2) > 0$

$\frac{2}{+} \frac{2}{-}$

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

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ب) $x^2 - 4x + 4 < 0 \rightarrow (x-2)(x-2) < 0$

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

$D_f = (1, 2)$

ج) $x^2 + 4x + 4 > 0 \rightarrow (x+2)(x+2) > 0$

$\frac{-2}{+} \frac{-2}{-}$

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

د) $x^2 - 4x + 4 < 0 \rightarrow (x-2)(x-2) < 0$

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

$D_f = [1, 4]$

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الف) $\frac{(x-1)(x-2)}{x-2} < 0 \rightarrow \frac{1}{-} \frac{1}{+}$

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

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ب) $\frac{(x-1)(x+1)}{(x-1)(x-2)} > 0$

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

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

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الف) $\frac{x^2 - 4x + 4}{x-2} > 0 \rightarrow \frac{(x-2)(x-2)}{(x-2)(x-2)} > 0$

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

$D_f = [2, +\infty)$

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ب) $x^2 - 1 \neq 0 \rightarrow (x-1)(x+1) \neq 0 \rightarrow x \neq 1, x \neq -1$

$D_f = \mathbb{R} - \{ \pm 1 \}$

الف) $x^2 - 4x > 0 \rightarrow x(x-4) > 0$

$\frac{0}{+} \frac{4}{-}$

$D_f = (-\infty, 0) \cup (4, +\infty)$

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ب) $|x-2| > 0 \rightarrow x < 2 \rightarrow -4 < x < 4$

$|x-2| > 0 \rightarrow |x| > 2 \rightarrow x > 2, x < -2$

$|x-2| \neq 1 \rightarrow x \neq \pm 3$

$D_f = (-4, -2) \cup (-2, 2) \cup (2, 4)$

ج) $\frac{x^2 - 4x + 4}{x-2} > 0 \rightarrow \frac{(x-2)(x-2)}{x-2} > 0 \rightarrow \frac{1}{-} \frac{1}{+}$

$1-x > 0 \rightarrow x < 1$

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

$D_f = (1, 10) - \{ 9 \}$

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د) $x^2 - 11x + 18 > 0 \rightarrow (x-2)(x-9) > 0$

$\frac{2}{+} \frac{9}{-}$

$\log \sqrt{x^2 - 1} \rightarrow x > 0, x \neq 1$

$D_f = (0, 2) \cup (9, +\infty)$

subject

Year Month Date

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ریشه ها:

	-1	0	1
$x^2 - n$	+	+	+
$x^2 + n$	+	-	+
y	+	-	+

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ریشه ها $y = \frac{x^2 - n}{x^2 + n} = \frac{x(n-1)}{x(n+1)}$

-1	0	1
+	-	+

$\frac{x - f(n)}{f(n)} > 0$

ریشه ها $f(n) = 0 \rightarrow n = 2, n = -2$

ریشه ها $n f(n) = 0 \rightarrow n = f(n) \rightarrow n = 2, n = -1$

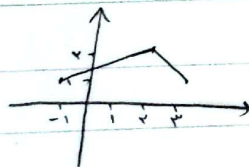
-2	-1	2	3
-	+	-	+

$D_f = [-2, -1] \cup [2, 3]$

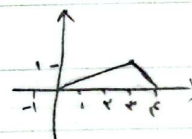
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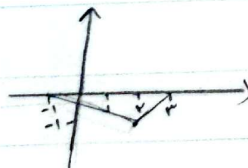
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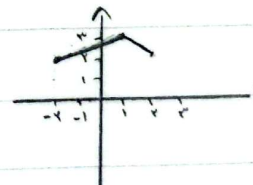
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