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سپهر علایی

$$m \quad 2x^2 + y^2 - 4x + 4y + k = 0$$

متابع مربع کامل

$$b + 2 = k$$

$$2x^2 - 4x + 2 \rightarrow (\sqrt{2}x - \sqrt{2})^2 \Rightarrow z = 2$$

$$y^2 + 4y + b \rightarrow (y + 2)^2 \Rightarrow b = 9$$

$$b = 9$$

$$b + 2 = k = 2 + 9 = 11$$

$$f(a) = a^2 + 4a = 2a + a + 2 = 3a + 2$$

$$a^2 + 4a = 3a + 2$$

$$a^2 + a - 2 = 0$$

$$(a + 2)(a - 1) = 0$$

$$a_1 = -2$$

$$a_2 = 1$$

$$a = 1$$

پس $a > 0$

$$x > 1$$

$$x \leq 1$$

$$f(1) = 4(1) + 1(1) = 5$$

$$|x + 1| > 2 \rightarrow \textcircled{1} \quad x + 1 > 2$$

$$\textcircled{2} \quad -x - 1 > 2 \Rightarrow -x > 3 \Rightarrow x < -3$$

$$f(x) \Rightarrow 11 - b = a \Rightarrow a + b = 22$$

$$\sqrt{4x - a} + \sqrt{b - 3x}$$

$$\textcircled{1} \quad 4x - a \geq 0$$

$$4x \geq a \Rightarrow x \geq \frac{a}{4}$$

$$12 \geq a$$

$$a = 12$$

$$\textcircled{2} \quad b - 3x \geq 0 \quad x = 2$$

$$b \geq 3x \Rightarrow b \geq 6$$

$$b = 6$$

$$b = 6$$

$$b = 6$$

$$a = 12$$

$$\frac{b}{a} = \frac{6}{12} = \frac{1}{2}$$

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$$\sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+x+4}}$$

دلتا منفی پس ریشه ندارد

$$\textcircled{1} \begin{cases} x+1=0 \\ x=-1 \end{cases}$$

$$\textcircled{1} \frac{-1}{-0} + \frac{3}{0} +$$

$$\begin{aligned} |x-3| &= 0 \\ x-3 &= 0 \quad x=3 \\ x-3 &= 0 \quad x=3 \end{aligned}$$

$$[1, 3) \cup (3, +\infty)$$

$$\textcircled{1} D_f = [-1, 3] - \{3\}$$

$$\textcircled{2} \begin{cases} 4-x=0 \\ x=4 \end{cases}$$

$$\textcircled{2} \frac{4}{+0} -$$

ب.

$$\textcircled{1} [x] - 2 \geq 0 \Rightarrow [x] \geq 2$$

$$2 - [x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x < 3$$

$$\textcircled{1} \cap \textcircled{2} = \emptyset \Rightarrow D_f = \emptyset$$

$$y = \sqrt{\frac{x^2 - x - 4}{x^2 + 13x + 40}} = \sqrt{\frac{x^2 - x - 4}{(x+3)(x+4)}}$$

$x_1 = 3 \quad x_2 = -2$

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$$(x^2 - 9)(x^2 - 4) \Rightarrow x_1 = 3 \quad x_2 = -3 \quad x_3 = 2 \quad x_4 = -2$$

$$\frac{-3}{+0} - \frac{2}{-0} - \frac{2}{+0} + \frac{3}{+0} +$$

$$D_f = (-\infty, -3) \cup (2, +\infty) - \{3\}$$

$$x^3 - 2x^2 - 5x + 4 = 0 \xrightarrow{+x-1} (x-1)(x-3)(x+2)$$

$0 =$ جمع ضرایب
پس $(x-1)$ تقسیم می کنیم

ب.

$$x^3 + 2x^2 - 5x - 4 = 0 \xrightarrow{+x+1} (x+1)(x^2 + x - 4) = (x+1)(x+3)(x-2)$$

$-1, -3, 2$

ارائه در صفحه بعد

$$+\frac{-3}{0} - \frac{2}{0} + \frac{-1}{0} - \frac{1}{0} + \frac{2}{0} - \frac{3}{0} + \quad D_f = (-\infty, -2) \cup (-1, 1) \cup (1, 2) \cup (2, \infty)$$

$$[-x] - 2 \geq 0 \Rightarrow [-x] \geq 2 \Rightarrow [x] < -2$$

$$x \leq -2$$

$$D_f = (-\infty, -2]$$

$$\omega x^2 + 4 \rightarrow \text{مربع كامل}$$

$$[x]^2 \cdot 4[x] - 3 = 0 \quad [x]^2 - 4[x] - 3 \neq 0$$

$$([x] - 3)([x] + 1) \neq 0$$

$$[x] \neq 3, [x] \neq -1 \Rightarrow$$

$$D_f = \mathbb{R} - ([3, 4) \cup [-1, 0))$$

$$\frac{\cot x + 1}{\tan x + 1}$$

$$\cot x \neq -1$$

$$x \neq \left\{ k\pi + \frac{\pi}{4} \right\}$$

$$\sin x \neq 0 \Rightarrow x \neq \{k\pi\}$$

$$\sin x$$

$$\cos x \neq 0 \Rightarrow x \neq \left\{ k\pi + \frac{\pi}{2} \right\}$$

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

$$\sqrt{1 - \sin^2 x} \Rightarrow 1 - \sin^2 x \geq 0 \Rightarrow \sin^2 x \leq 1$$

$$\sin^2 x \leq \frac{1}{4}$$

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

$$1 - \log_{\frac{1}{x}} x^{-1} \geq 0$$

$$x - 1 > 0 \quad \boxed{x > 1} \quad (1)$$

$$1 > \log_{\frac{1}{x}} x^{-1}$$

$$x - 1 > \frac{1}{x} \quad \boxed{x > \frac{1+x}{x}} \quad (2)$$

$$D_f = \left[\frac{1}{x}, +\infty \right) \quad \checkmark$$

$$x^2 - x \geq 0$$

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

$$x_1 = 0$$

$$x_2 = 1$$

$$\frac{0}{+} \frac{1}{-} \frac{1}{+}$$

$$[-\infty, 0] \cup [1, +\infty) \quad (1)$$

$$1 - \log_{\frac{x^2-x}{x}} \neq 0 \Rightarrow \log_{\frac{x^2-x}{x}} \neq 1 \Rightarrow x^2 - x \neq x$$

$$x^2 - 2x \neq 0$$

$$x^2 - 2x > 0$$

$$x(x-2) > 0$$

$$x_1 = 0 \quad x_2 = 2$$

$$(x-1)(x+1) \neq 0$$

$$x \neq 1$$

$$x \neq -1 \quad (2)$$

$$(-\infty, 0) \cup (2, +\infty) \quad (3)$$

$$D_f = (-\infty, 0) \cup (2, +\infty) - \{1, -1\} \quad \checkmark$$

١٠ - الف

$$x^2 - x^2 - 1 \geq 0$$

$$x^2 - x^2 \geq 1$$

$$x^2 - x^2 \geq 1$$

$$x^2 - x^2 - 1 \leq 0$$

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

$$D_f = [1, 2] \quad \checkmark$$

$$\frac{wx + \omega}{x + \varepsilon} \in \mathbb{W} \Rightarrow x \in \frac{\varepsilon W - \omega}{\varepsilon W - x} \Rightarrow$$

$$D_f = \left\{ x \mid x = \frac{\omega - \varepsilon k}{\varepsilon k - x}, k \in \mathbb{W} \right\}$$

$$x \in \frac{-\varepsilon W + \omega}{\varepsilon W - x} \quad \checkmark$$