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نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره: کلاس: *الف*

$$x^2 - 4x + y^2 + 4y + k = 0 \quad (1, 1, 5)$$

$$P((x-1)-1) + (y+3)^2 - 9 = P(x-1)^2 - 4 + (y+3)^2 - 9 =$$

$$P(x-1)^2 + (y+3)^2 - 11 + k = 0$$

$$P(x-1)^2 + (y+3)^2 = 11 - k \rightarrow 11 - k \geq 0 \rightarrow 11 \geq k$$

تابع نقطه (1, -3) k=11

$$x^2 + 4x = 4x + a + 4 \rightarrow x^2 + 4x = 4x + 4 \rightarrow x^2 + x - 4 = 0$$

$$(x+4)(x-1) = 0 \quad (4)$$

$$x = -4 \text{ یا } x = 1 \rightarrow x = 1 \checkmark$$

$$x^2 + 4x = 4x + 1 + 4 \rightarrow x^2 + x - 5 = 0 \quad f(x) = 0$$

$$\begin{cases} 4x^2 + 4x & ; |x+1| \geq 2 \\ a + 4x & ; -4 \leq x \leq -1 \end{cases} \rightarrow x = -4 \quad (4)$$

$$|x+1| \geq 2 \rightarrow x \geq 1 \checkmark$$

$$|x+1| \leq -2 \rightarrow x \leq -3$$

$$P(-3) - b = a - 6$$

$$4 \times 9 + 4 = a + b = 40$$

$$\sqrt{4x-a} + \sqrt{b-4x} \xrightarrow{x=4} 4x-a \geq 0 \rightarrow 12-a \geq 0 \rightarrow 12 \geq a$$

$$b-4x \geq 0 \rightarrow b-16 \geq 0 \rightarrow b \geq 16$$

$$\frac{b}{a} = \frac{16}{12} = \frac{4}{3}$$

(4)

$$x+1 \geq 0 \rightarrow x \geq -1 \quad \text{و} \quad x-4 \leq 0 \rightarrow x \leq 4 \quad \Rightarrow P = [-1, 4] - \{3\}$$

$$4-x \geq 0 \rightarrow x \leq 4$$

$$x \neq 3 \quad \Delta < 0$$

(1, 1, 5)

$$\sqrt{x-4} + \sqrt{4-x} \Rightarrow I \geq 0 \Rightarrow [x] \geq 4 \Rightarrow x \geq 4$$

$$II \geq 0 \Rightarrow [x] \leq 4 \Rightarrow x \leq 4$$

پاسخ: $[-1, 4] - \{3\}$

الف) $x^3 - x - 9 \geq 0 \rightarrow (x-3)(x+3) \geq 0$

$x^3 - 13x^2 + 34x - 24 \geq 0 \rightarrow (x-1)(x-2)(x-3)(x+4) \geq 0$

$P_f = (-\infty, 1) \cup (2, 3) \cup (3, +\infty)$

الف) $x^3 - 2x^2 - 5x + 4 \geq 0 \rightarrow (x-1)(x-2)(x+4) \geq 0$

$x^3 + 4x^2 - 5x - 4 \geq 0 \rightarrow (x-1)(x+1)(x+4) \geq 0$

$P_f = (-\infty, -4) \cup (-1, 1) \cup (1, +\infty)$

الف) $\sqrt{f(x)} - 2 \rightarrow f(x) - 4 \geq 0 \rightarrow x^2 \geq 4 \rightarrow x \leq -2 \vee x \geq 2$

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

ب) $\frac{2x^2 + 4}{x^3 - 2x^2 - 5x + 4} \rightarrow [x]^3 - 2[x]^2 - 5[x] + 4 \neq 0 \rightarrow ([x]-1)([x]-2)([x]+4) \neq 0$

$P_f = \mathbb{R} - \{1, 2, -4\}$

الف) $\frac{\cos x + 1}{\sin x} + 1 = \frac{\cos x + \sin x}{\sin x} = \frac{\cos x}{\sin x} = \cot x$

$1 - \frac{1}{\sin^2 x} \geq 0 \rightarrow 1 \geq \frac{1}{\sin^2 x} \rightarrow \frac{1}{\sin^2 x} \leq 1 \rightarrow \frac{1}{\sin x} \leq 1 \vee \frac{1}{\sin x} \geq -1$

$\frac{1}{\sin x} \leq 1 \rightarrow \sin x \geq \frac{1}{2}$

$\frac{1}{\sin x} \geq -1 \rightarrow \sin x \leq -1$

$\frac{\pi}{6} \leq \sin x \leq \frac{5\pi}{6}$

الف) $x-1 > 0 \rightarrow x > 1$

$1 - \log_{\frac{1}{x}} \frac{1}{x} \geq 0 \rightarrow 1 \geq \log_{\frac{1}{x}} \frac{1}{x} \rightarrow x-1 \leq \frac{1}{x} \rightarrow x \leq \frac{x}{x-1}$

$P_f = (1, \frac{x}{x-1}]$

ب) $x^2 - x \geq 0 \rightarrow x(x-1) \geq 0 \rightarrow x \leq 0 \vee x \geq 1$

$x^2 - 4x \geq 0 \rightarrow x(x-4) \geq 0 \rightarrow x \leq 0 \vee x \geq 4$

$\log_{\frac{x}{x-1}} \frac{x}{x-1} \neq 1 \rightarrow \frac{x}{x-1} \neq x-1 \rightarrow x^2 - 2x + 1 \neq 0 \rightarrow (x-1)^2 \neq 0 \rightarrow x \neq 1$

$P_f = (-\infty, 0) \cup [1, 4) \cup (4, +\infty)$

الف) $x^2 - x^2 = 0$

$(x-1)(x-2) \leq 0$

$P_f = [1, 2]$

ب) $\frac{x^2 + 2x}{x^2 + x} \in \mathbb{W} \rightarrow x = \frac{x^2 + 2x}{x^2 + x} \rightarrow [x] = \frac{x^2 + 2x}{x^2 + x}$