

نام و نام خانوادگی (نام خانوادگی) پاسخنامه تشریحی تکلیف شماره ... کلاس ...

$$x^2 - 4x + y^2 + 4y + k = 0$$

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

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

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

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

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

$$x = -4 \text{ یا } x = 1 \quad \boxed{x=1} \checkmark \rightarrow x^2 + 4x = 4x + 4 + 4 \rightarrow x^2 + x = 4 \rightarrow f(x) = 4$$

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

$$\begin{aligned} |x+1| \geq 2 & \rightarrow x \geq 1 \\ |x+1| \leq -2 & \rightarrow x \leq -3 \end{aligned}$$

$$4(-2) - b = a - 4$$

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

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

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

$$\frac{b}{a} = \frac{4}{12} = \frac{1}{3}$$

$$\begin{aligned} x+1 \geq 0 & \rightarrow x \geq -1 \\ x-4 \geq 0 & \rightarrow x \geq 4 \\ x-4 \leq 0 & \rightarrow x \leq 4 \\ x \neq 3 & \quad \Delta < 0 \end{aligned} \Rightarrow D = [-4, 4] - \{3\}$$

$$\begin{aligned} \text{ب) } \sqrt{x-4} + \sqrt{4-x} & \Rightarrow I \geq 0 \rightarrow [x] \geq 4 \rightarrow x \geq 4 \\ \sqrt{x-4} & \geq 0 \rightarrow [x] \leq 4 \rightarrow x \leq 4 \end{aligned}$$

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

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

$x \mid \begin{array}{c|c|c|c|c} - & + & - & + & + \end{array}$ $P_f = (-\infty, 3) \cup (1, +\infty) - \{2\}$

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

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

$x \mid \begin{array}{c|c|c|c|c|c|c} - & - & + & - & + & - & + \end{array}$ $P_f = (-\infty, 2) \cup (1, 4) \cup [10, +\infty)$

الف) $\sqrt{1-x} - 1 \rightarrow 1-x - 1 \geq 0 \rightarrow -x \geq 0 \rightarrow x \leq 0$

$P_f = (-\infty, 0]$

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

$P_f = \mathbb{R} - [1, 2]$ $[x] \neq 1$

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

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

$\sin x \geq 1$ $\frac{\pi}{2} \leq \sin x \leq \frac{3\pi}{2}$

الف) $x-1 > 0 \rightarrow x > 1$ $\log \frac{1}{x} \geq 0 \rightarrow 1 > \log x$

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

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

ب) $x^2 - x \geq 0 \rightarrow x(x-1) \geq 0$ $x \mid \begin{array}{c|c|c} + & - & + \end{array}$

$x^2 - 4x \geq 0 \rightarrow x(x-4) \geq 0$ $x \mid \begin{array}{c|c|c} + & - & + \end{array}$

$\log \frac{x^2 - 4x}{x^2 - x} \neq 1 \rightarrow x^2 - 4x \neq x^2 - x \rightarrow x^2 - 4x - x^2 + x \neq 0 \rightarrow -3x \neq 0 \rightarrow x \neq 0$

$P_f = (-\infty, -1) \cup (-1, 0) \cup (\frac{4}{3}, +\infty)$

الف) $x^2 - x^2 = 0$ $x^2 - x^2 \geq 1 \rightarrow x^2 - x^2 \geq 1 \rightarrow x^2 - x^2 \geq 1 \rightarrow x^2 - x^2 \geq 1$

$(x-1)(x-1) \leq 0$ $x \mid \begin{array}{c|c|c} + & - & + \end{array}$

$x=1$ $x=1$

$P_f = [1, 1]$

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