

۱۷، ۱۷۵

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

$$\text{الف) } \frac{x-1}{x} - \frac{x}{x-1} = \frac{-x^2+1}{x^2-x}$$

$$\frac{-x^2+1}{x^2-x} \geq 0 \quad x \mid \begin{array}{ccc} 0 & \frac{1}{x} & 1 \\ + & - & + \end{array}$$

$$x \in (-\infty, 0) \cup [\frac{1}{x}, 1) \checkmark$$

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

$$x-1 \neq 0 \rightarrow x \neq 1, x+2 \neq 0 \rightarrow x \neq -2 \text{ ②}$$

$$x^2+5 \neq 0 \rightarrow x \neq -\frac{5}{x} \text{ ③}$$

$$\frac{\frac{1}{x+1} - \frac{2}{x}}{\frac{x}{x-1} + \frac{1}{x+2}} = \frac{-(x-1)(x+2)(-x-2)}{(x^2+5)(x)(x+1)}$$

$$\text{①} \cup \text{②} \cup \text{③} \rightarrow x \in \mathbb{R} - \{-1, 0, 1, -2, -\frac{5}{x}\} \checkmark$$

$$\text{الف) } (\frac{1}{x})^x - 9 = 0 \rightarrow x = -2$$

$$x^2 - x^x = 0 \rightarrow x = \frac{5}{x}$$

$$((\frac{1}{x})^x - 9)(x^2 - x^x) \geq 0$$

$$x \mid \begin{array}{ccc} -2 & \frac{5}{x} & \\ + & - & + \end{array} \quad x \in (-\infty, -2] \cup [\frac{5}{x}, +\infty) \checkmark$$

ب)

$$x-1 \geq 0 \rightarrow x \geq 1 \rightarrow x \in [1, +\infty) \quad [1, 12]$$

$$y = \sqrt{x-1} - 4\sqrt{x-1} + 8$$

$$3 - \sqrt{x-1} \geq 0 \rightarrow x \leq 12$$

$$\log_{\frac{1}{x}}(x^2 - x - 2) \rightarrow x^2 - x - 2 > 0 \rightarrow (x-2)(x+1) > 0 \quad x \mid \begin{array}{ccc} -1 & \frac{2}{x} & \\ + & - & + \end{array}$$

$$x \in (-\infty, -1) \cup (2, +\infty) \text{ ① } \sqrt{x^2-1} + 1 \neq 0 \checkmark$$

$$x^2 - 1 \geq 0 \quad x \mid \begin{array}{ccc} -1 & 1 & \\ + & - & + \end{array} \quad x \in (-\infty, -1] \cup [1, +\infty) \text{ ②}$$

$$\text{①} \cap \text{②} \rightarrow x \in (-\infty, -1) \cup (2, +\infty) \checkmark$$

$$\begin{array}{c} \text{ریشه های معادله} \\ x = -2 \rightarrow x^2 - 2x - 5 = 0 \rightarrow \alpha = -\frac{1}{x} \rightarrow \sqrt{x - \frac{x}{x} - x^2} = f(x) \end{array}$$

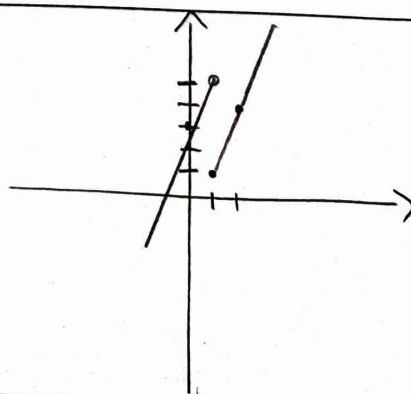
$$\rightarrow a+b = x_1 + x_2 = -\frac{b}{a} = -\frac{-\frac{1}{x}}{-1} = -\frac{1}{x} = -2 + b \rightarrow b = \frac{x}{2}$$

$$S = -\frac{b}{a}$$

$$a+b = \text{①}$$

$$f(x) - x \geq 0 \rightarrow f(x) \geq x$$

$$\left. \begin{array}{l} x=1 \rightarrow y=1 \\ x=2 \rightarrow y=4 \\ x=0 \rightarrow y=3 \end{array} \right\} x \in [-3, 1) \cup [2, +\infty) \checkmark$$



$$\left. \begin{aligned} 2f(\omega) &= f(-1) + a \\ f(\omega) &= va + v \\ f(-1) &= 3a - 1 \end{aligned} \right\} 12a + 12 = 3a - 1 \rightarrow 10a = -13 \rightarrow a = -1,3 \checkmark$$

9
6

$$\left. \begin{aligned} 2 - \sqrt{3} &= \left(\frac{\sqrt{3}}{\sqrt{4}} + \frac{1}{\sqrt{4}} \right)^2 \\ 2 + \sqrt{3} &= \left(\frac{\sqrt{3}}{\sqrt{4}} + \frac{1}{\sqrt{4}} \right)^2 \end{aligned} \right\} \begin{aligned} f(2 - \sqrt{3}) + f(2 + \sqrt{3}) &= \frac{\sqrt{3} - 1}{\sqrt{4}} + \frac{\sqrt{3}}{\sqrt{3} - 1} + 2 + \frac{\sqrt{3} + 1}{\sqrt{4}} \\ &+ \frac{\sqrt{3}}{\sqrt{3} + 1} + 2 = \frac{3 - 2\sqrt{3} + 2}{\sqrt{4} - \sqrt{3}} + \frac{3 + 2\sqrt{3} + 2}{\sqrt{4} + \sqrt{3}} + 4 = \\ &\frac{\sqrt{3} - 1}{\sqrt{4} - \sqrt{3}} + \frac{\sqrt{3} + 1}{\sqrt{4} + \sqrt{3}} + 4 = \frac{\sqrt{12}(\sqrt{3} - 1)}{\sqrt{3}(\sqrt{3} - 1)} + \frac{\sqrt{12}(\sqrt{3} + 1)}{\sqrt{3}(\sqrt{3} + 1)} + 4 = 2\sqrt{4} + 4 \checkmark \end{aligned}$$

7
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$$\begin{aligned} 2f(x) - 3f(-x) &= 4x^2 - x \cdot x^2 \rightarrow 4f(x) - 9f(-x) = 8x^2 - 2x \\ 2f(-x) - 3f(x) &= 4x^2 + x \cdot x^2 \rightarrow 4f(-x) - 9f(x) = 12x^2 + 3x \\ -5f(x) &= 10x^2 + x \rightarrow f(x) = -2x^2 - \frac{x}{5} \checkmark \end{aligned}$$

8
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$$\left. \begin{aligned} x=0 \rightarrow 2f(0) &= 3m - 1 \\ x=-1 \rightarrow 4f(0) &= 1\omega + \omega m \end{aligned} \right\} 9m - 3 = 1\omega + \omega m \rightarrow m = 1, \omega$$

$$f(0) = \frac{3m - 1}{2} = 1, \omega \checkmark$$

9
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$$\begin{aligned} f(x) &= ax + b \rightarrow f\left(\frac{1}{x}\right) = \frac{a}{x} + b \\ f(x) + f\left(\frac{1}{x}\right) &= ax + b + \frac{a}{x} + b = \frac{ax^2 + bx}{x} + \frac{a + bx}{x} = \frac{3x^2 - 12x + 3}{x} \\ \rightarrow a &= 3, b = -4 \rightarrow f(x) = 3x - 4 \rightarrow f(-1) = -7 \checkmark \end{aligned}$$

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10