

۵۴/۶/۲۳

دستم دختر A

سارینا زارع

تکلیف شماره ۷

(۱)

$x \cdot f(x) \geq 0$
 $\hookrightarrow f(x)$
 ریشه ها: $0, 2, \omega$
 ریشه: 0

بازه	علامت x	علامت $f(x)$	علامت $x \cdot f(x)$
$(-\infty, -\omega)$	-	-	+
$(-\omega, 0)$	-	-	+
$(0, 2)$	+	-	-
$(2, \omega)$	+	+	+
(ω, ∞)	+	-	-

$D_f = (-\infty, 0] \cup [2, \omega]$

(۲)

$y = \sqrt{\frac{-x}{f(x)}} \rightarrow \frac{-x}{f(x)} \geq 0$
 ریشه: 0
 ریشه ها: $0, 2, \omega, -3$

بازه ها	علامت $-x$	علامت $f(x)$	علامت $\frac{-x}{f(x)}$
$(-\infty, -3)$	+	-	-
$(-3, 0)$	+	+	+
$(0, 2)$	-	-	+
$(2, \omega)$	-	+	-
$(\omega, +\infty)$	-	-	X

$D_f = (-3, 0) \cup (0, 2)$

$\mathbb{Z} \rightarrow \{-2, -1, 1\}$ اعداد صحیح

۳ عدد صحیح

X بعد از بیغ نداریم

(۳)

$f(x) - 2f(2) = x^2 - 3x + 4$
 $x=2 \rightarrow f(2) - 2f(2) = 2^2 - 6 + 4 \rightarrow -f(2) = 2 \rightarrow f(2) = -2$
 $f(-2) = ? \rightarrow f(-2) - \frac{(2 \cdot (-2) - 4)}{+4} = 4 + 6 + 4 \rightarrow f(-2) = 10$

(۴)

$f(x) = \begin{cases} x - \sqrt{x+4} & ; x > 3 \\ 2x+3 & ; x \leq 3 \end{cases}$
 $f(\omega) = \omega - \sqrt{\omega+4} = 2 \rightarrow f(2) = 2 \times 2 + 3 = 7$
 $f(1) = 1 \times 2 + 3 = \omega \rightarrow f(\omega) = 2$
 $f(f(\omega)) + f(f(1)) = 7 + 2 = 9$

$f(x) = ax^2 - bx + 2$
 $f(x-1) - f(x) = 9x + 2$
 $a - b = ?$

$f(x-1) = a(x-1)^2 - b(x-1) + 2 \Rightarrow ax^2 - 2ax + a - bx + b + 2 \Rightarrow ax^2 - x(2a+b) + (a+b+2)$
 $f(x) = ax^2 - bx + 2$
 $f(x-1) - f(x) \Rightarrow ax^2 - x(2a+b) + (a+b+2) - ax^2 + bx - 2 \Rightarrow -2ax + a + b$

$-2ax + (a+b) = 9x + 2$
 $a = -2$
 $-2 + b = 2 \rightarrow b = 4$
 $a - b \rightarrow -2 - 4 = -6$

(۶)

$f(x) = \frac{x^2 + 4x + \omega}{x^2 + 4x + 7}$
 $f(\sqrt{3}-2) = ?$
 $(\sqrt{3}-2)^2 = 3 - 4\sqrt{3} + 4 = 7 - 4\sqrt{3}$
 $4(\sqrt{3}-2) = 4\sqrt{3} - 8$

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

$$f(-3) = ? \rightarrow (x - \frac{1}{x})^2 = x^2 - 2 + \frac{1}{x^2} = \frac{(-3)^2}{9} \rightarrow x^2 + \frac{1}{x^2} = \boxed{11}$$

(V)

$$f(x) = \{(2, 0), (1, -4), (0, 2), (7, 1)\}$$

$$g(x) = \sqrt{9 - x^2}$$

(A)

الف) $\frac{f}{g} \Rightarrow \{(2, \frac{0}{\sqrt{5}}), (1, \frac{-4}{\sqrt{5}}), (0, \frac{2}{3}), (7, \frac{1}{\sqrt{5}})\}$

$\hookrightarrow \frac{f}{g} = \{(2, 0), (1, \frac{-4}{\sqrt{5}}), (0, \frac{2}{3})\}$

$0 \rightarrow \sqrt{9 - 0^2} = 3$

$1 \rightarrow \sqrt{9 - 1} = \sqrt{8} = 2\sqrt{2}$

$2 \rightarrow \sqrt{9 - 4} = \sqrt{5}$

$7 \rightarrow \sqrt{9 - 49} \text{ غير حقيقي } X \rightarrow \text{نسرار كل غير حقيقي}$

ب) $\frac{g}{f} \Rightarrow \{(2, \frac{\sqrt{5}}{0}), (1, \frac{\sqrt{5}}{-4}), (0, \frac{3}{2}), (7, \frac{1}{\sqrt{5}})\} \rightarrow \{(1, \frac{\sqrt{2}}{2}), (0, \frac{3}{2})\}$

☆ $f(x) = \{(2, 1), (3, 4), (-5, 2), (1, -2)\}$

(9)

الف) $2f(x) = \{(2, 2), (3, 8), (-5, 4), (1, -4)\}$

ب) $f(x) + 1 = \{(2, 2), (3, 5), (-5, 3), (1, -1)\}$

ج) $3f(x) + 1 \Rightarrow \{(2, 4), (3, 13), (-5, 13), (1, 13)\}$

د) $f(2x) \rightarrow \{(1, 1), (\frac{3}{2}, 4), (\frac{-5}{2}, 2), (\frac{1}{2}, -2)\}$

$$f(x) = \{(2, 3), (7, 2), (1, 4), (3, 1), (5, 2)\}$$

$$g(x) = \{(1, 0), (2, 1), (-1, 4), (-2, 3), (3, -1)\}$$

(10)

الف) $f - g \rightarrow \{(2, 2), (1, 4), (3, 2)\}$

ب) $\frac{2f}{g} \rightarrow \{(1, \frac{6}{0}), (2, \frac{9}{1}), (3, \frac{2}{-1})\} \rightarrow \{(2, 9), (3, -2)\}$

$\hookrightarrow 2f = \{(2, 6), (7, 4), (1, 8), (3, 2), (5, 4)\}$