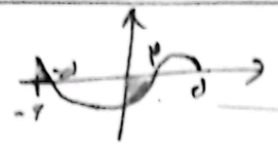
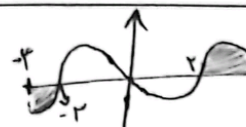


$y = \sqrt{x f(x)}$ $x f(x) \geq 0$
 (تاسفی)

 $\Rightarrow [-2, 5] \cup (0, 2)$

از آنجایی که $f(x)$ غیر همبسته است $\Rightarrow D_f = [-4, 5] - \{[-4, 5] \cup (0, 2)\}$ یا $D_f = [-5, 0] \cup [2, 5]$

$y = \sqrt{\frac{-x}{f(x)}} \Rightarrow \frac{-x}{f(x)} \geq 0$
 (تاسفی)

 $\Rightarrow [-2, 5] \cup (2, 5)$

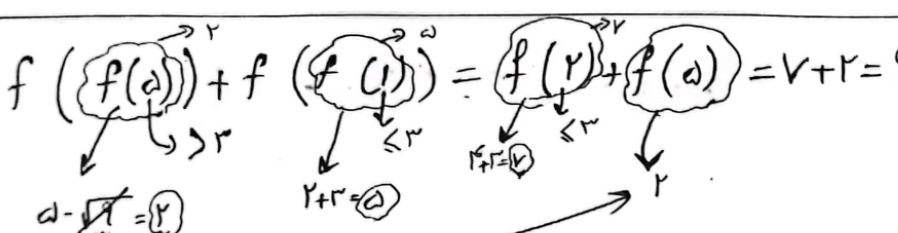
از آنجایی که $f(x)$ همبسته است $\Rightarrow D_f = [-4, 5] - \{[-4, 5] \cup (2, 5)\}$ یا $D_f = [-2, 2] \cup \{5\}$

اعداد صحیح مورد نظر: $-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5$

$f(2) - 2f(2) = 2^2 - 4 + 2 \Rightarrow f(2) = 2 \Rightarrow f(2) = -2$

$f(-2) - 2f(-2) = (-2)^2 - (-4) + 2 \Rightarrow f(-2) = 4 + 4 + 2 = 10$

$f(-2) = 10$

$f(f(2)) + f(f(1)) = f(2) + f(5) = 2 + 7 = 9$


$f(x) = \begin{cases} x - \sqrt{x+4} & ; x > 3 \\ x + 2 & ; x \leq 3 \end{cases}$

$f(x-1) - f(x) = 4x + 2 \Rightarrow a(x-1) - b(x-1) + 2 - (ax^2 - bx + 2) = 4x + 2$
 $\Rightarrow ax^2 - 2ax + a - bx + b - ax^2 + bx = 4x + 2 \Rightarrow -2ax + a + b = 4x + 2$

$\begin{cases} -2a = 4 \\ a + b = 2 \end{cases} \Rightarrow \begin{cases} a = -2 \\ b = 4 \end{cases} \Rightarrow a - b = -6$

$$f(x) = \frac{x^2 + 5x + 6}{x^2 + 4x + 4} \Rightarrow f(\sqrt{x} - 2) = \frac{(\sqrt{x} - 2)^2 + 5(\sqrt{x} - 2) + 6}{(\sqrt{x} - 2)^2 + 4(\sqrt{x} - 2) + 4} = \frac{1^2 - 4\sqrt{x} + 4 + 5\sqrt{x} - 10 + 6}{1^2 - 4\sqrt{x} + 4 + 4\sqrt{x} - 8 + 4} = \frac{1}{1} = 1$$

$$f(\sqrt{x} - 2) = 1$$

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

$$(-3 = x - \frac{1}{x}) \times x \Rightarrow x^2 + 3x - 1 = 0 \Rightarrow x^2 = -3x + 1$$

$$f(-3) = \frac{(-3x + 1)^2 + 1}{-3x + 1} = \frac{9x^2 - 6x + 1 + 1}{-3x + 1} = \frac{9x^2 - 6x + 2}{-3x + 1}$$

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$$الف) \frac{f}{g} = \left\{ (1, 0), (1, \frac{1}{\sqrt{11}}), (0, \frac{1}{\sqrt{11}}) \right\}$$

$$ب) \frac{g}{f} = \left\{ (1, \frac{\sqrt{11}}{-1}), (0, \frac{\sqrt{11}}{1}) \right\}$$

$$f(x) = \{(1, 0), (1, -1), (0, 2), (1, 1)\} \quad g(x) = \{(1, \sqrt{11}), (1, \sqrt{11}), (0, 2), (1, \frac{1}{\sqrt{11}})\}$$

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

$$الف) 2f(x) = \{(1, 2), (1, 4), (-1, 4), (1, -2)\} \quad ب) f(x) + 1 = \{(1, 2), (1, 4), (-1, 4), (1, -2)\}$$

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$$ج) 3f^2(x) + 1 = \{(1, 13), (1, 21), (-1, 21), (1, 4)\} \quad ب) f(2x) = \{(1, 1), (1, 2), (1, 2), (1, -2)\}$$

$$f(x) = \{(1, 2), (1, 2), (1, 2), (1, 2)\} \quad g(x) = \{(1, 1), (1, 1), (-1, 4), (-1, 4), (1, -1)\}$$

$$الف) f \cdot g = \{(1, 2), (1, 4), (1, 2)\}$$

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$$ب) \frac{2f}{g} = \{(1, 4), (1, 4), (1, -2)\}$$