

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

	-4	-2	0	2	3
x		-	-	+	+
f(x)		+	0	-	+
xf(x)		+	0	-	+

$$\Rightarrow D_f = [-2, 0] \cup [2, 3]$$

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

	-4	-3	0	2	3
-x		+	+	0	-
f(x)		-	0	+	0
$\frac{-x}{f(x)}$		-	+	+	-

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

$$\Rightarrow -2, -1, 1 \Rightarrow \text{۳ عدد صحیح}$$

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$$x = 2 \rightarrow f(2) - 2f(2) = \frac{4-4+4}{2} \Rightarrow f(2) = -2$$

$$x = -2 \rightarrow f(-2) - 2f(-2) = \frac{4+4+4}{-4} \Rightarrow f(-2) = 1$$

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$$f(f(5)) + f(f(1))$$

$$\underbrace{f+3}_r + \underbrace{f+3}_{r+3=5} = \underbrace{5-\sqrt{5+f}}_r = 9$$

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

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$$f(n-1) - f(n) = 4n + 2 \xrightarrow{\text{بازای هر مقدار از n درست}} f(0) - f(1) = 4 + 2$$

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$$f(x) = ax^2 - bx + 2 \rightarrow \begin{cases} f(1) = a - b + 2 \\ f(0) = 2 \end{cases}$$

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

$$\hookrightarrow 2 - a + b - 2 = 1 \rightarrow -a + b = 1 \rightarrow a - b = -1$$

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$$f(x) = \frac{x^2 + 4x + 5}{x^2 + 4x + 7} = \frac{x^2 + 4x + 4 + 1}{x^2 + 4x + 4 + 3} = \frac{(x+2)^2 + 1}{(x+2)^2 + 3} \xrightarrow{x = \sqrt{3} - 2} \frac{(\sqrt{3} - 2 + 2)^2 + 1}{(\sqrt{3} - 2 + 2)^2 + 3} = \frac{1 + 1}{1 + 3} = \frac{2}{4} = \frac{1}{2}$$

$$\frac{x^{r+1}}{x^r} = \frac{x^r}{x^r} + \frac{1}{x^r} = x^r + \frac{1}{x^r} = \left(x + \frac{1}{x}\right)^r - r$$

$$\Rightarrow f(-3) = (-3)^r + r = 11$$

$$f\left(x - \frac{1}{x}\right), f(-r) \Rightarrow x - \frac{1}{x} = -r$$

$$\text{الف) } \frac{f}{g} = \left\{ \left(0, \frac{2}{3}\right), \left(1, \frac{-4}{\sqrt{2}}\right), \left(2, \frac{0}{\sqrt{5}}\right) \right\}$$

$$\text{ب) } \frac{g}{f} = \left\{ \left(0, \frac{3}{2}\right), \left(1, \frac{\sqrt{2}}{-4}\right) \right\}$$

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

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

$$\text{ج) } 3f^2(x) + 1 = \{(2, 4), (3, 49), (-5, 13), (1, 13)\}$$

$$\text{د) } f(2x) = \left\{ \left(1, 1\right), \left(\frac{3}{2}, 4\right), \left(-\frac{5}{2}, 2\right), \left(\frac{1}{2}, -2\right) \right\}$$

$$\text{الف) } f \circ g = \{(1, 4), (2, 2), (3, 2)\}$$

$$\text{ب) } 2f = \{(2, 4), (3, -2)\}$$