

$$y = \sqrt{x f(x)} \rightarrow x f(x) \geq 0 \rightarrow f(x) \geq 0 \text{ با } x \geq 0, D_f = [-4, -5] \cup [2, 5]$$

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ریشه ها: ۰، ۲، -۳، ۵

x	-۵	-۲	۰	۳
y	-	+	-	+

مختصات: $(-\infty, -5] \cup [-2, 0] \cup [3, +\infty)$
 مختصات: $[-5, -2] \cup [0, 3]$

ریشه ها: ۰، ۲، ۳، ۵

f(x)	-۳	۰	۲	۵
y	-	+	-	+

مختصات: $(-\infty, -3] \cup (0, 2) \cup (5, +\infty)$
 مختصات: $(-3, 0) \cup (2, 5)$

$-x f(x) = D_f = (-3, 0) \cup (0, 2) \rightarrow$ اعداد صحیح را به دست آوریم: $-2, -1, 0, 1, 2$

$$f(x) - 2f(2) = x^2 - 3x + 4 \xrightarrow{f(2)} f(2) - 2f(2) = (2)^2 - 3(2) + 4$$

$$-f(2) = 2 \rightarrow f(2) = -2$$

$$f(-2) = f(-2) - 2(-2) = (-2)^2 - 3(-2) + 4 \Rightarrow f(-2) = -4 + 4 + 4 + 4 = 10$$

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$$1 \leq 3 \rightarrow f(1) = 2(1) + 3 = 5 \quad \omega > 3 \rightarrow f(\omega) = (\omega) - \sqrt{(\omega) + 4} = 2$$

$$2 \leq 3 \rightarrow f(2) = 2(2) + 3 = 7$$

$$f(f(\omega)) + f(f(1)) = f(2) + f(\omega) = 7 + 2 = 9$$

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

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

$$f(x-1) - f(x) = 4x + 2 \quad (II)$$

(I), (II) $\Rightarrow a - 2ax + b = 4x + 2 \rightarrow$ (همیشه برقرار)
 $-2ax = 4x \rightarrow a = -2$
 $a + b = 2 \rightarrow -2 + b = 2 \rightarrow b = 4$
 $a - b = -2 - 4 = -6$

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$$f(x) = x^r - w_{x+1} \rightarrow f(3) = (3)^r - w(3) + 1 = 1$$

$$f(-1) = (-1)^r - w(-1) + 1 = w$$

$$f(r) = (r)^r - w(r) + 1 = -1$$

$$rf(3) + f(-1) / f(r) = r(1) + w / (-1)^r = \boxed{r}$$

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$$r > r \rightarrow f(r) = w(r) + 1 = 1^r, \quad -r < r \rightarrow f(-r) = (-r)^r = r$$

$$r > r \rightarrow f(r) = w(r) + 1 = r$$

$$wf(r) - rf(-r) / f(r) = w(1^r) - r(r) / (r) = \boxed{w/r}$$

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$$f = \{(r, 4), (w, r), (r, 1), (1, 4)\} \quad f(r) = 1, f(1) = 4, f(w) = r, f(r) = 4$$

$$f(1) = 4$$

$$f(f(r)) - f(f(w)) / f(1) - r = f(1) - f(r) / 4 - r = 4 - 4/r = 0$$

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$$f(x) = x^r + rx + 4 / x^r + rx + w \rightarrow x = \sqrt{r} \rightarrow f(\sqrt{r}) = \frac{(\sqrt{r})^r + r(\sqrt{r}) + 4}{(\sqrt{r})^r + r(\sqrt{r}) + w} = \frac{r + r - r\sqrt{r} + r\sqrt{r} - 1 + 4}{r + r - r\sqrt{r} + r\sqrt{r} - 1 + w} = 1 / r = r \Rightarrow f(r) = \frac{r^r + r(r) + 4}{r^r + r(r) + w} = \boxed{r / w}$$

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$$f(x) = x^r + 1/x^r \rightarrow f(\sqrt{x}) = (\sqrt{x})^r + 1/(\sqrt{x})^r = x + 1/x$$

$$(f(\sqrt{x}))^r - f(x) = (x + 1/x)^r - x^r - 1/x^r = x^r + 1/x^r + r - x^r - 1/x^r = r$$

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