

۲- آزمون

$$y = \sqrt{x f(x)}$$

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

	$(-\infty, -5)$	-5	$(-5, 0)$	0	$(0, 2)$	2	$(2, 5)$	5
x	-	-	-	0	+	+	+	+
$f(x)$	+	0	-	-	-	0	+	0
$x f(x)$	-	0	+	0	-	0	+	0

$$D_f = [-5, 0] \cup [2, 5]$$

✓

$$\frac{-x}{f(x)} \geq 0$$

$$-x, 0, 2, 5$$

x	$(-\infty, 0)$	$(0, 2)$	$(2, 5)$
$\frac{-x}{f(x)}$	+	+	-

✓

$$D_f = (-\infty, 0) \cup (0, 2) \cup (2, 5)$$

$$f(x) = x f(x) = x^2 - 3x + 1$$

$$f(-1) - x f(x) = f - x + 1 \rightarrow f(-1) - x f(x) = f + x + 1$$

$$-f(x) = x$$

$$f(x) = -x$$

$$f(-1) = 1$$

✓

$$f(f(a)) + f(f(1))$$

$$f(a) = a - \sqrt{a} = 1$$

$$a + 1 = 9$$

$$f(f(a)) = 1 \times 1 + 1 = 2$$

$$f(1) = 1 \times 1 + 1 = 2 \rightarrow f(f(1)) = 1$$

✓

$$f(x) = ax^2 - bx + 1$$

$$f(n-1) = a(n-1)^2 - b(n-1) + 1 = a(n^2 + 1 - 2n) - b(n-1) + 1$$

$$-2an = 4n$$

$$a = -2$$

$$a + b = 1$$

$$-2 + b = 1$$

$$b = 3$$

$$an^2 + a - 2an - bn + b + 1 = an^2 + bn + 1 = 4n + 1$$

$$-2an + a + b = 4n + 1$$

✓

$$a - b$$

$$-2 - 3 = -5$$

$$f(3) = 9 - 9 + 1 = 1$$

$$f(-1) = 1 + 3 + 1 = 5$$

$$f(2) = 8 - 4 + 1 = 5$$

$$\frac{f(f(3)) + f(f(-1))}{f(2)} = \frac{5}{5} = 1$$

Ⓟ ✓

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$$f(5) = 25 \times 5 + 1 = 126$$

$$f(-2) = 5$$

$$f(2) = 5$$

$$\frac{f(126) - f(f(5))}{5} = \frac{126}{5}$$

Ⓟ ✓

✓

$$f = \{(1, 9), (9, 2), (2, 1), (4, 4)\}$$

$$\frac{f(f(1)) - f(f(9))}{f(1) - 9} = 0$$

Ⓟ ✓

1

$$f(x) = \frac{x^2 + 5x + 9 - 2 + 2}{x^2 + 5x + 2 + 1 - 1} = \frac{\sqrt{x(x+1)} + 2}{(x+1)^2 + 1} = \frac{x+2}{x+1} = \frac{1}{x} = x$$

$$x = \sqrt{x} - 1 \rightarrow x + 1 = \sqrt{x}$$

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

Ⓟ ✓

9

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

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

Ⓟ ✓

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

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