

$$y = \sqrt{x f(x)} \quad \begin{array}{cccc} -8 & 0 & 2 & 0 \\ - & + & - & + \end{array} \quad D_f = [-8, 0] \cup [2, 0]$$

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$$y = \sqrt{\frac{x-0}{f(x)}} \quad \begin{array}{cccc} -2 & 0 & 2 & 0 \\ + & - & + & - \end{array} \quad D_f = [-2, 0] \cup (0, 2)$$

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$$f(x) = f(x) = x^2 - 4x + 4 \Rightarrow f(x) = -2 \Rightarrow f(x) = x^2 - 4x + 4 \Rightarrow f(-2) = 4 + 8 + 4 = 16$$

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$a(n-1)^2 - b(n-1) + 2 = an^2 + bx^2 = (x+1)^2$
 $x(-1a - b + b) + (a^2b) = (x+1)^2$. $(a+1) \Rightarrow a = -1$ و $a^2b = 1 \Rightarrow b = -1$
 $a - b = -1 - (-1) = 0$
 $f(x) = -1x^2 + 1x + 1$

جواب سوال ۵:

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$f(0) = 0 - \sqrt{0+1} = -1$ و $f(1) = 1 + \sqrt{1+1} = 1 + \sqrt{2}$
 $f(1) = 1 + \sqrt{2}$ و $f(0) = -1 \Rightarrow f(f(0)) = 1 + \sqrt{2}$
 $f(f(0)) = 1 + \sqrt{2}$ و $f(1) = 1 + \sqrt{2} \Rightarrow f(f(1)) = 1 + \sqrt{2}$

جواب سوال ۶:

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$$f(x) = 9 - 9x + |x| \quad f(-1) = 4 \quad f(1) = 1 \quad f(1) = 1 \Rightarrow f'(1) = 1$$

$$\frac{f'(x) + f(-1)}{f'(1)} = \frac{1 + 0}{1} = 1$$

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$$f(x) = \sqrt{x+1} \quad f(-1) = 0 \quad f(1) = \sqrt{2}$$

$$\frac{f'(x) - f(-1)}{f'(1)} = \frac{1 - 0}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

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

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

$$f\left(\frac{2}{3}\right) = \frac{\left(\frac{10}{3}\right)^2}{\left(\frac{10}{3}\right)^2 + 1} = \frac{\frac{100}{9} + 1}{\frac{100}{9} + 1} = \frac{109}{109} = 1 = f(f(\sqrt{2}-1))$$

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

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

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