

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

$$\begin{cases} x f(x) \geq 0 \rightarrow x \geq 0 \\ D_{f(x)} = [-4, 5] \end{cases}$$

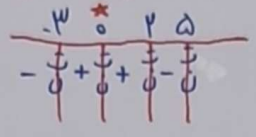
$$[0, +\infty) \cap [-4, 5] \rightarrow D_{x f(x)} = [0, 5]$$

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

ریشه‌ها: $x = -3, x = 0, x = 2, x = 5$

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



$$D_f = (-3, 0) \cup (0, 2) \rightarrow \{-2, -1, 1\} \rightarrow \text{شامل سه عدد صحیح می باشد}$$

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

$$-f(2) = 4 \rightarrow f(2) = -4 \rightarrow f(x) + 4 = x^2 - 3x + 4 \rightarrow f(x) = x^2 - 3x$$

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

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

$$f(5) = 5 - \sqrt{5+4} = 5 - \sqrt{9} = 5 - 3 = 2 \rightarrow f(f(5)) = f(2) = 4 + 3 = 7$$

$$f(1) = 2 + 3 = 5 \rightarrow f(f(1)) = f(5) = 5 - \sqrt{5+4} = 5 - \sqrt{9} = 5 - 3 = 2$$

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

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

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

$$\begin{cases} a + b - 2ax = 4x + 2 \\ -2ax = 4x \rightarrow a = -2 \\ a + b = 2 \xrightarrow{a=-2} b - 2 = 2 \rightarrow b = 4 \end{cases}$$

$$a - b = -2 - 4 = -6$$

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$$f(x) = \frac{x^v + fx + \Delta}{x^v + fx + v}$$

$$f(\sqrt{w} - v) = \frac{(\sqrt{w} - v)^v + f(\sqrt{w} - v) + \Delta}{(\sqrt{w} - v)^v + f(\sqrt{w} - v) + v} = \frac{w + f - f\sqrt{w} + f\sqrt{w} - \Delta + \Delta}{w + f - f\sqrt{w} + f\sqrt{w} - \Delta + v} = \frac{f}{v} = \frac{v}{w}$$

$$f\left(x - \frac{1}{x}\right) = \frac{x^v + 1}{x^v} = \underbrace{x^v + \frac{1}{x^v}}_{-v + v} = \left(x - \frac{1}{x}\right)^v + v \rightarrow f(x) = x^v + v$$

$$f(-v) = (-v)^v + v = 9 + v = 11$$

<p>الف $9 - x^v > 0 \rightarrow x^v < 9 \rightarrow -3 < x < 3 \rightarrow D_g = [-3, 3]$ $D_f = \{v, 1, 0, v\}$ $D_g \cap D_f = \{v, 1, 0\} \rightarrow \frac{f}{g} =$ $\left\{ \left(v, \frac{0}{\Delta} \right), \left(1, \frac{-f}{\sqrt{\Delta}} \right), \left(0, \frac{v}{w} \right) \right\} \rightarrow \frac{f}{g} =$ $\left\{ \left(v, 0 \right), \left(1, -\sqrt{v} \right), \left(0, \frac{v}{w} \right) \right\}$</p>	<p>ب $9 - x^v > 0 \rightarrow x^v < 9 \rightarrow -3 < x < 3 \rightarrow D_g = [-3, 3]$ $D_f = \{v, 1, 0, v\}$ $D_g \cap D_f = \{v, 1, 0\} \rightarrow \frac{g}{f} =$ $\left\{ \left(v, \frac{\Delta}{0} \right), \left(1, \frac{\sqrt{\Delta}}{-f} \right), \left(0, \frac{w}{v} \right) \right\} \rightarrow \frac{g}{f} =$ $\left\{ \left(1, \frac{\sqrt{\Delta}}{-f} \right), \left(0, \frac{w}{v} \right) \right\}$</p>
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<p>الف $vf(x)$</p>	<p>ب $f(x) + 1$</p>	<p>ج $wf^v(x) + 1$</p>	<p>د $f(vx)$</p>
$\left\{ (v, v), (w, \Delta), (-\Delta, f), (1, -f) \right\}$	$\left\{ (v, v), (w, \Delta), (-\Delta, w), (1, -1) \right\}$	$\left\{ (v, f), (w, f^v), (-\Delta, w), (1, w) \right\}$	$\left\{ (1, 1), \left(\frac{w}{v}, f \right), \left(\frac{-\Delta}{v}, v \right), \left(\frac{1}{v}, v \right) \right\}$

<p>الف $f - g$ $D_f \cap D_g = \{v, w, 1\} \rightarrow f - g =$ $\left\{ (v, v), (w, v), (1, f) \right\}$</p>	<p>ب $\frac{vf}{g}$ $D_f \cap D_g = \{v, w, 1\} \rightarrow \frac{vf}{g} =$ $\left\{ \left(v, \frac{v}{1} \right), \left(w, \frac{v}{-1} \right), \left(1, \frac{\Delta}{0} \right) \right\} \rightarrow \frac{vf}{g} =$ $\left\{ (v, v), (w, -v) \right\}$</p>
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