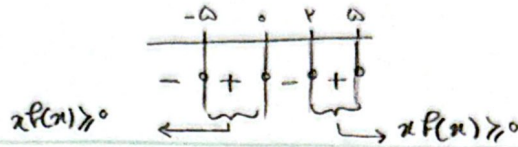
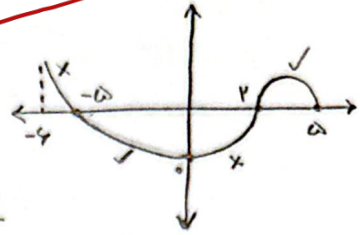


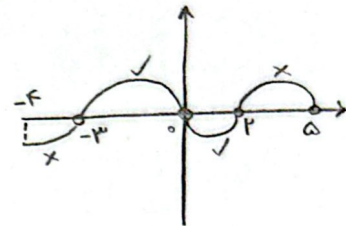
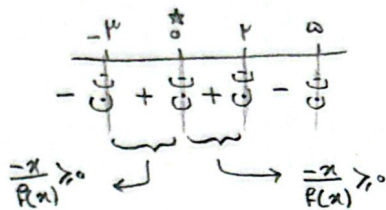
۲۵ عالی

$$y = \sqrt{x f(x)} \leadsto x f(x) \geq 0 \Rightarrow D_f = [-\Delta, 0] \cup [r, \Delta]$$



$$y = \sqrt{\frac{-x}{f(x)}} \leadsto \frac{-x}{f(x)} \geq 0 \Rightarrow D_f = (-r, 0) \cup (0, r) \leadsto \{-r, -1, 1\}$$

شامل ۳ صفر



$$f(x) - r f(r) = x^2 - r x + r \xrightarrow{x=r} -f(r) = r \leadsto f(x) = x^2 - r x \leadsto f(-r) = r + r = 10$$

$$f(x) = \begin{cases} x - \sqrt{x+r} & ; x > r \\ r x + r & ; x \leq r \end{cases} \Rightarrow f(f(\Delta)) + f(f(1)) = f(r) + f(\Delta) = r + r = 9$$

$$\Rightarrow f(\Delta) = \Delta - r = r, f(1) = r + r = \Delta, f(r) = r + r = \Delta$$

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

$$\leadsto a + b - 2ax = 4x + r \leadsto a = (-r), b = \Delta \Rightarrow a - b = -r - \Delta = -1$$

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

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$$f(x - \frac{1}{x}) = \frac{x^2 + 1}{x^2}, f(-3) = ? \leadsto f(x - \frac{1}{x}) = \frac{x^2 + 1}{x^2} \leadsto (x - \frac{1}{x})^2 + 2 \leadsto f(-3) = 9 + 2 = 11$$

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$$g(x) = \sqrt{9-x^2} \leadsto 9-x^2 \geq 0 \leadsto -3 \leq x \leq 3$$

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

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

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

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

$(\frac{1}{2}, -1)$

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

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