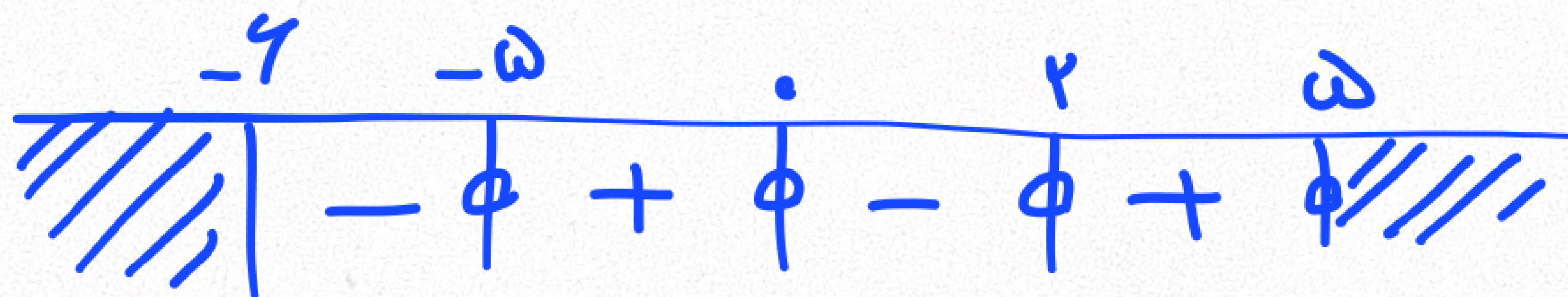


$$y = \sqrt{x f(x)} \rightarrow x f(x) \geq 0 \rightarrow D_f = [-2, 5] - ([0, 2) \cup [4, 5])$$

۱۵



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

$$y = \sqrt{\frac{-x}{f(x)}} \rightarrow \frac{-x}{f(x)} \geq 0 \rightarrow D_f = (-3, 0) \cup (0, 2) \rightarrow -2 \text{ و } -1$$

۲

۳ عدد صحیح

$$x = 2 f(2) - f(2) = 4 - 2 = 2$$

$$x = -2 \rightarrow f(-2) - 2 f(2) = 4 + 2 + 2 \rightarrow 10 = f(-2)$$

۲

$$\left. \begin{array}{l} f(f(5)) = f(2) \rightarrow f(2) = 7 \\ f(f(1)) = f(5) \rightarrow f(5) = 2 \end{array} \right\} 7 + 2 = 9$$

۲

$$f(x) \rightarrow x = 1 \rightarrow 2 + a - b \quad \left| \quad x = 1 \rightarrow f(x-1) = 2 \right.$$

$$\text{سوال} \rightarrow f(x-1) - f(x) = 6x + 2 \rightarrow 2 - (2 + a - b) = 6 + 2$$

۲

$$a - b = -1$$

(۱۵) $f(u) = \frac{(u+2)^2 + 1}{(u+2)^2 + 3}$

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

به جای x قرار می دهیم $\sqrt{3}-2$

$$\frac{(\sqrt{3}-2)^2 + 1}{(\sqrt{3}-2)^2 + 3} = \frac{9 - 4\sqrt{3} + 4\sqrt{3} - 1 + 1}{9 - 4\sqrt{3} + 4\sqrt{3} - 1 + 3} = \frac{4}{8} = \frac{1}{2}$$

$f(x - \frac{1}{x}) = \frac{x^4 + 1}{x^2} \rightarrow x^2 + \frac{1}{x^2} = (x - \frac{1}{x}) + 2 \rightarrow 11 = f(-3)$

(۲)

۹۶ $\sqrt{9-x^2} \rightarrow g(x) = 9-x^2 \geq 0 \rightarrow 9 \geq x^2 \rightarrow 3 \geq x \geq -3$ (الف)

$Dg \cap Df = \{2, 1, 0\}$ $\frac{f}{g} = \{(0, \frac{1}{3}), (1, \sqrt{2}), (2, 0)\}$

$\frac{g}{f} = \{(0, \frac{3}{2}), (1, -\frac{\sqrt{2}}{2})\}$ ✓

(۲)

$2f(x) = \{(2, 2), (3, 8), (-5, 4), (1, -4)\}$ (الف)

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

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

$f(2x) = \{(4, 1), (6, 4), (-10, 2), (2, -2)\} \rightarrow \{(1, 1), (\frac{3}{2}, 4), (-\frac{5}{2}, 2), (\frac{1}{2}, -1)\}$

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

$\frac{2f}{g} = \{(2, 6), (1, \frac{5}{2}), (3, -2)\}$ (ب)

صورت در مخرج است

(۲)