

۱ (الف) $y^3 - 2xy^2 = 2x - 1 \Rightarrow y^3 = 2xy^2 + 2x - 1 \Rightarrow \begin{cases} (x_1, y_1) \\ (x_2, y_2) \end{cases} \xrightarrow{m_1 = m_2} y_1 = y_2 \Rightarrow \begin{cases} y_1^3 = y_2^3 \\ y_1^2 = y_2^2 \end{cases}$ تابع است ✓

۱ (ب) $x = \frac{12}{y} \Rightarrow \frac{12}{y} \cos y = y \cos y \Rightarrow \cos y = 0 \Rightarrow y = \frac{\pi}{2} \neq \frac{3\pi}{2} \Rightarrow$ تابع است ✓

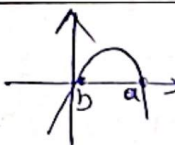
۱ (ج) $x + y = \sqrt{xy} \xrightarrow{\text{مربع}} x^2 + y^2 + 2xy = xy \Rightarrow x^2 + y^2 - xy = 0 \Rightarrow (x - y)^2 = 0 \Rightarrow x = y$ تابع است ✓

۱ (د) $x(y^2 + 2) - y(y^2 + 2) = 0 \Rightarrow (x - y)(y^2 + 2) = 0 \Rightarrow x = y$ تابع است ✓

۲ (الف) $|y| + x^2 = 2y \rightarrow \begin{cases} \text{if } y > 0 \rightarrow y = x^2 \\ \text{if } y = 0 \rightarrow y = \frac{x^2}{2} \\ \text{if } y < 0 \rightarrow y = \frac{x^2}{2} \end{cases}$  تابع است ✓

۲ (ب) $\{y\} + \{x\} = 1 \rightarrow \begin{cases} \text{if } x = -0.14 \dots \dots \dots \\ \text{if } y = 1.14, 2.14, 3.14, \dots \end{cases} \rightarrow$ تابع است ✓
(بسته در دور (مستقیم) و غیره (دایره))

۳ $f(x) = \begin{cases} 2x^2 - b & x \geq 2 \\ a + 2x & 0 \leq x \leq 2 \\ 2x^2 - b & x \leq -1 \end{cases} \Rightarrow x = 2 \Rightarrow 2(2)^2 - b = a + 4 \Rightarrow 12 - b = a + 4 \Rightarrow 12 - b = a + 4 \Rightarrow a + b = 8$ ✓

۴ $f(x) = \sqrt{-x^2 - bx + a} \Rightarrow [a, b]$ 
طول شیب (الف) $\Rightarrow x = \frac{a+b}{2} = \frac{-b}{2(-1)} = \frac{-(-b)}{-2} = \frac{b}{-2} \Rightarrow \frac{a+b}{2} = \frac{b}{-2} \Rightarrow -a - b = b \Rightarrow 2b = -a$ ✓
ب (ب) $\Rightarrow ab = 2b \Rightarrow 2 = \frac{ab}{b} \Rightarrow a = 2, b = -1 \Rightarrow S = a + b = +1$ ✓

۵ $\frac{x}{\sqrt{ax^2 + bx + c}} \rightarrow ax^2 + bx + c > 0, D_f = (-\infty, 2) \Rightarrow \begin{cases} a = 0 \\ 2b + c = 0 \Rightarrow -2b = c \end{cases}$ ✓
 $3a + c - 2|b| = -2|b| + c + 3(0) \Rightarrow c + 3b = -2b + 3b = +b$ ✓
جواب سوال

$$y = \sqrt{\frac{xm - am + x + ab}{a+b}} = \sqrt{\frac{(x+a)m - ab}{a+b}} \Rightarrow D_f = (x_1 + \infty)$$

$$\rightarrow \text{خط افقی} = x \Rightarrow x+b=0 \Rightarrow b = -x$$

$$y = \sqrt{x^2 - a} \Rightarrow x^2 - a \geq 0 \rightarrow x(x-1)(x+1) \geq 0$$

$$\Rightarrow D_f = [-1, 0] \cup [1, +\infty)$$

$$y = \frac{1}{\sqrt{|x|-1}} \Rightarrow \begin{cases} |x|-1 > 0 \Rightarrow |x| > 1 \Rightarrow [1, +\infty) \cup (-\infty, -1] \\ |x|-1 \neq 0 \Rightarrow x \neq \pm 1 \end{cases} \rightarrow D_f = \mathbb{R} - [-1, 1]$$

$$\sqrt{\frac{1}{|x| - [a]}} \Rightarrow |x| - [a] \neq 0 \rightarrow |x| \neq [a] \Rightarrow D_f = \mathbb{R} - [a]$$

$$\sqrt{x} + \sqrt{y} = 4 \Rightarrow \sqrt{y} = 4 - \sqrt{x} \rightarrow \begin{cases} \sqrt{x} \geq 0 \rightarrow x \geq 0 \\ \sqrt{y} \geq 0 \rightarrow 4 - \sqrt{x} \geq 0 \rightarrow \sqrt{x} \leq 4 \rightarrow x \leq 16 \end{cases} \Rightarrow D_f = [0, 16]$$

$$y = \frac{1}{\sqrt{[xm - \frac{1}{x}] + [xm + \frac{x}{x}]}} \Rightarrow [xm - \frac{1}{x}] + [xm + \frac{x}{x}] > 0$$

$$[xm + \frac{x}{x}] = [xm + \frac{1}{x}] + x \Rightarrow 2[xm - \frac{1}{x}] + x > 0 \Rightarrow [xm - \frac{1}{x}] > -\frac{x}{2}$$

$$\Rightarrow [xm - \frac{1}{x}] > -1 \Rightarrow x \geq \frac{1}{2} \Rightarrow D_f = [\frac{1}{2}, +\infty)$$

$$y = \sqrt{1 - \log(xm - a)}, D_f = (b, c]$$

$$\Rightarrow \begin{cases} \log(xm - a) \leq 1 \rightarrow 10 \geq xm - a \rightarrow xm \leq 10 + a \\ xm - a > 0 \rightarrow xm > a \end{cases}$$

$$\Rightarrow a < xm \leq 10 + a, b < xm \leq c \Rightarrow \begin{cases} b = a \\ c = 10 + a \end{cases} \Rightarrow c - b = 10 + a - a = 10$$

$$c - b = \frac{c - b}{1} = \frac{10}{1} = 10$$