

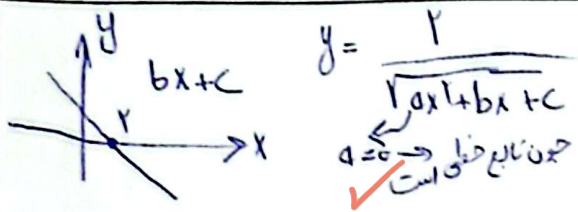
الف) $y_1^2 = 1x^2 + 2x - 1$ و $y_2^2 = 2x^2 + 2x - 1 \rightarrow y_1^2 = y_2^2 \Rightarrow y_1 = y_2$ تابع است
 ب) $y = 0$ و $y = 2x$ $\rightarrow$ تابع نیست $\rightarrow$ مثال نقض $\rightarrow$ تابع نیست

ج) $x+y = 2\sqrt{xy} \Rightarrow x^2 + y^2 + 2xy = 4xy \Rightarrow (x-y)^2 = 0 \Rightarrow y = x$ تابع است
 د) $y^2(x-y) + 2(x-y) = (y^2+2)(x-y) = 0 \Rightarrow y = x$ تابع است

۱-۱) بین تابع ۲ شرط است.
 $|x-1| \geq 2 \rightarrow x-1 \geq 2 \rightarrow x \geq 3$
 $x-1 \leq -2 \rightarrow x \leq -1$

$2(-1)^2 - b = a + 2(-1) \Rightarrow 2 - b = a - 2 \Rightarrow a + b = 4$

$f(x) = \sqrt{a-bx-x^2}$ تابع راستی گفته $\rightarrow$
 $\begin{cases} x=a \rightarrow a-ab-a^2=0 \Rightarrow 1-b-a=0 \\ x=b \rightarrow a-b^2-b^2=0 \Rightarrow a=2b^2 \end{cases}$
 $1-b-a=0 \Rightarrow 1-b-2b^2=0 \Rightarrow (2b-1)(b+1)=0 \rightarrow b=-1$ $\rightarrow$ $a=2$
 $a=2b^2 \Rightarrow a=2$
 $a+b=1$
 $b=-1 \leq -b$



$y = \frac{2}{\sqrt{ax^2+bx+c}}$
 $bx+c > 0 \rightarrow x > \frac{-c}{b}$
 $x < 2$ و $x < \frac{-c}{b}$
 $\frac{-c}{b} = 2 \Rightarrow c = -2b$
 $\frac{c}{b} = 2 \Rightarrow c = 2b$
 $c = -2b \rightarrow x < \frac{-(-2b)}{b} = 2$
 $c = 2b \rightarrow x < \frac{-2b}{b} = -2$
 $x < 2$ و $x < -2$
 $x < -2$

الف) $|x| - [x] \neq 0 \rightarrow f(x) = \begin{cases} x - [x] & x \geq 0 \\ -x - [x] & x < 0 \end{cases} \rightarrow f(x) \neq 0$
 $Df = \mathbb{R} - \mathbb{N}$

ب) $9 - \sqrt{x} = \sqrt{y} \Rightarrow 9 - \sqrt{x} \geq 0 \Rightarrow 9 \geq \sqrt{x}$
 $\rightarrow x \leq 81$

$$x < \sqrt{11} < 3 \rightarrow |x| < 9 \rightarrow -9 < x < 9$$

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$$2x-1 \geq 0 \rightarrow x \geq \frac{1}{2} \text{ و } x=0, x+1 \geq 0 \rightarrow 2x-1 \geq 1$$

$$2x \geq 1 \Rightarrow x \geq \frac{1}{2} \Rightarrow Df = [\frac{1}{2}, +\infty) - [1], \text{ if } 0 < x < 1 \rightarrow \log_a x - 1$$

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10) $f(x) = \begin{cases} 4 + \sqrt{x} - x & x \geq 0 \\ 1 + \sqrt{x} + x & x < 0 \end{cases}$ $\sqrt{x} = x - 4 \Rightarrow x^2 = x^2 - 12x + 16$

$$x^2 + 11x + 14 = 0 \Rightarrow x^2 - 12x + 16 = (x-4)(x-9)$$

$$Df = [0, 4] \cup [9, +\infty)$$

$$x^2 - 12x + 16 = 0 \Rightarrow x = 4, 9$$

$$Df = [\frac{1}{2}, \frac{9}{2}]$$

$$y = \sqrt{\frac{3x+1}{x+b}} + a \Rightarrow y = \sqrt{\frac{(a+3)x + ab+1}{x+b}}$$

$$\frac{a(a+3)x + ab+1}{x+b} \geq 0 \Rightarrow x+b \geq 0 \Rightarrow x \geq -b \Rightarrow x \geq 1 \Rightarrow \boxed{b = -1}$$

و رت نباید بین داشته باشد. $a=3, a+3=6$

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$$\begin{cases} [x] \geq 5 \rightarrow x \geq 5 \\ [x] \leq 5 \rightarrow x < 5 \end{cases} \Rightarrow f(x) = \begin{cases} 2x-1 & x \geq 5 \\ 2x+3 & x < 5 \end{cases}$$

$$f'(x) = \begin{cases} \sqrt{2x-1} - x+1 = \sqrt{x} & x \geq 5 \\ \sqrt{2x+3} - x+1 = \sqrt{x+2} & x < 5 \end{cases}$$

$$Df: [5, +\infty) \cup [\frac{-3}{2}, 5) \Rightarrow Df = [\frac{-3}{2}, +\infty)$$

$$y = \frac{3(2x+1)^3}{(2x+1)^4} = \frac{3}{2x+1}$$

$$\Rightarrow 2x+1=0 \Rightarrow x = -\frac{1}{2} \rightarrow Df = \mathbb{R} - [-\frac{1}{2}]$$

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$$2x-d \geq 0 \rightarrow x \geq \frac{d}{2} \text{ و } 1 - \log(2x-d) \geq 0 \Rightarrow 1 \geq \log(2x-d)$$

$$\Rightarrow 1 \geq \log(2x-d) \Rightarrow \frac{10+d}{2} \geq x \rightarrow Df = [\frac{d}{2}, \frac{10+d}{2}]$$

$$c-b = \frac{10+d}{2} - \frac{d}{2} = \frac{10}{2} = 5$$

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