

تابع و خواص آن ها

حاجز دهم دفتر A

سنت پیش از این

$$A = \{1, 2, 3\} \quad B = \{2, 3\} \quad A \times B - B' = \emptyset$$

①

$$(B' = B \times B)$$

$$\{(1, 2) (1, 3) (2, 2) (2, 3) (3, 2) (3, 3)\} - \{(2, 2) (2, 3) (3, 3) (3, 2)\} \\ = \{(1, 2) (1, 3)\} \leftarrow$$

② مقدار m تابع بودن

$$f(x) = \{(x, m^2), (2, 1), (-3, m), (-2, m), (3, m+2), (m, 4)\}$$

$$m^2 - m - 2 = 0$$

$$m = -1 \text{ OR } m = 2 \quad \text{خ ت و ق}$$

$$g(x) = \{(x, m^2), (2, 1), (m, 4), (3, m+2), (-2, m), (-1, 3)\}$$

$$m^2 - m - 2 = 0$$

$$m = -1 \text{ OR } m = 2$$

$$m = \text{شماره ۱} \leftarrow$$

به مقدار هیچ m تابع نیست!

$$a \times b = 5$$

③

$$f(x) = \begin{cases} x^2 - 1 & x \leq 1 \\ ax + b & 1 < x \leq 2 \\ x^2 & x \geq 2 \end{cases}$$

$$a + b = 0 \rightarrow a = -b$$

$$1 = 2a + b$$

$$a = 1$$

$$b = -1$$

$$a \times b = -4 \leftarrow$$

$$f(x) = \begin{cases} 2x-3 & x \geq k \\ 4-3x & x < k \end{cases}$$

$$2k-3 = 4-3k$$

$$\Delta k = 5$$

$$k = \frac{7}{5}$$

(4)

$$f(x) = \begin{cases} -x+2 & x > 1 \\ -x & -1 \leq x < 1 \\ x-1 & x < -1 \end{cases}$$

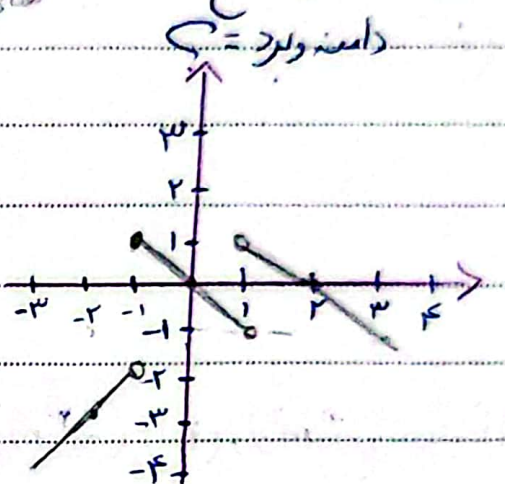
x	1	2	3
y	1	0	-1
x	-1	0	1
y	1	0	-1
x	-1	-2	-3
y	-1	-2	-3

شکل تابع؟ (5)

دامنه و برد؟

$$D_f = (-\infty, 1) \cup (1, +\infty)$$

$$R_f = (-\infty, -2) \cup (-1, 1]$$



$$الف) 2y^3 + x^2 + 1 = 0$$

تابع است؟

(6)

$$ب) x^2 + 4y^2 - 2x - 12y + 10 = 0$$

$$(x-1)^2 + 4(y-\frac{3}{2})^2 = 0$$

$$(1, \frac{3}{2})$$

تابع است؟

(1)

$$(\frac{3}{2})$$

$$الف) \lim_{x \rightarrow \infty} x \sin y = y \sin x \xrightarrow{x \rightarrow \infty} 0 = y \times 0 = 0 = 0$$

(7)

تابع نیست ب x اما مقعر به y در عمل نمی کند - تابع نیست!

$$ب) \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

$$2 = \frac{x}{y} + \frac{y}{x} + 2$$

$$2yx = x^2 + y^2 \rightarrow 0 = (x-y)^2 \rightarrow x=y$$

تابع است

الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{x-2}{x}} =$ (8)

I $\frac{x-1}{x-3} \geq 0$ $\frac{1}{x-3}$ $(-\infty, 1] \cup (3, +\infty)$ $\leftarrow$

II $\frac{x-2}{x} \geq 0$ $\frac{1}{x}$ $(0, 2] \cup D = (0, 1] \leftarrow$

ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{3}$ $x \geq 0$ $\sqrt{3} - \sqrt{x} \geq 0$ II $3 \geq x$ $\rightarrow D = [0, 3]$ (8)

الف) $y = \frac{\sqrt{x^2 - \sqrt{x} + 4}}{\sqrt{x - \log x + 14}}$ $x^2 - \sqrt{x} + 4 \geq 0$ $(x-1)(x-4) \geq 0$ $\frac{1}{x}$ $(-\infty, 1] \cup [4, +\infty)$ $\rightarrow$
 $-9x + 14 \geq 0$ $\frac{14}{9}$ $(-\infty, \frac{14}{9})$ $\leftarrow$ $D = (-\infty, 1]$ (9)

ب) $\sqrt{\frac{x^2 - \sqrt{x} + 4}{x^2 - \log x + 14}}$ $x^2 - \sqrt{x} + 4 \geq 0$ $\frac{1}{x}$ $(-\infty, 1] \cup [4, +\infty)$ $\rightarrow$
 $x^2 - \log x + 14 \geq 0$ $\frac{1}{x}$ $(-\infty, 1] \cup [4, +\infty)$ $\rightarrow$ $D = (-\infty, 1] \cup [4, +\infty)$ (9)

الف) $\sqrt{2x^2 - 5x + 3} \rightarrow (-\infty, 1] \cup [\frac{3}{2}, +\infty)$ (10)
 $\sqrt{2x^2 - 5x + 3} \rightarrow (-\infty, 1] \cup [\frac{3}{2}, +\infty)$
 $D_f = (-\infty, 1] \cup [\frac{3}{2}, +\infty)$ $\leftarrow$

ب) $\sqrt{\frac{2x^2 - 5x + 3}{x^2 - \log x + 14}}$ $(1, \frac{3}{2})$ $\frac{1}{x}$ $(-\infty, 1] \cup [4, +\infty)$ $\rightarrow$
 $x^2 - \log x + 14 \geq 0$ $\frac{1}{x}$ $(-\infty, 1] \cup [4, +\infty)$ $\rightarrow$ $D = (-\infty, \frac{3}{2}) - \{1\} \cup [\frac{3}{2}, +\infty)$