

$$A \times B - B^c = \{(1,2), (1,3), (2,2), (2,3), (3,2), (3,3)\} \\ - \{(2,2), (2,3), (3,2), (3,3)\} = \{(1,2), (1,3)\}$$

-۱

$$m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \Rightarrow m \begin{cases} +2 \\ -1 \end{cases} \quad (۲-الف)$$

$$m = 2 \Rightarrow \text{تابع } X \quad m = -1 \Rightarrow \text{تابع } \sqrt{\quad}$$

$$m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow (m-2)(m+1) = 0 \Rightarrow m \begin{cases} +2 \\ -1 \end{cases} \quad (ب)$$

بازای هیچ عددی از m تابع نیست.

$$m = 2 \Rightarrow \text{تابع } X \quad m = -1 \Rightarrow \text{تابع } X$$

$$x=1 \Rightarrow x^2 - 1 = ax + b \Rightarrow 0 = a + b \quad \begin{matrix} -a + b = 0 \\ 2a + b = 1 \\ \hline a = 1 \end{matrix}$$

$$x=2 \Rightarrow ax + b = x^2 \Rightarrow 2a + b = 1$$

$$a + b = 0 \Rightarrow a = 1 \Rightarrow b = -1 \Rightarrow a \times b = -1$$

-۳

$$2x - 3 = f - 3x \Rightarrow 5x = 5 \Rightarrow x = 1 \Rightarrow K = \frac{5}{5} = 1$$

$$K = K - 4$$

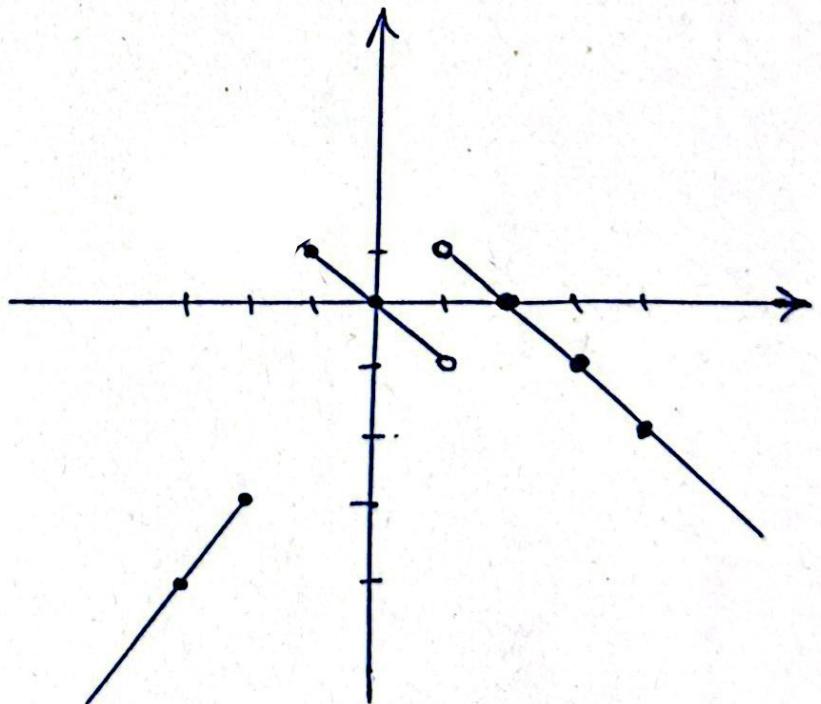
$$f(x) = \begin{cases} -x + 2 & ; x > 1 \\ -x & ; -1 \leq x < 1 \\ x - 1 & ; x < -1 \end{cases}$$

-۵

x	2	3	4
y	0	-1	-2

x	-1	0
y	$+1$	0

x	-2	-3
y	-3	-4



$$2y^3 + x^2 + 1 = 0$$

$$y^3 = \frac{-x^2 - 1}{2} \Rightarrow y_1^3 = \frac{-(x^2 + 1)}{2} \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2$$

$$y_2^3 = \frac{-(x^2 + 1)}{2}$$

۶- الف

تابع

$$x^2 + 2y^2 - 2x - 12y + 10 = 0 \Rightarrow x^2 - 2x + 1 + 2y^2 - 12y + 9 = 0$$

$$(x-1)^2 + (2y-3)^2 = 0$$

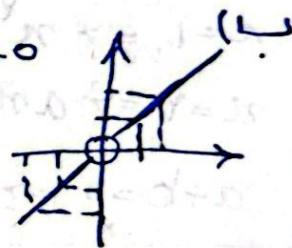
نکته $\frac{1}{2}$ در عبارت صفری کند و عبارت تابع بدود.

$$x \sin y = y \sin x$$

۷- الف) اگر $x=0$ باشد $0 = y \sin 0$ و y بی‌نهایت
مقادیری تواند داشت باشد پس تابع نیست.

$$\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} + 2 = 4 \Rightarrow \frac{x^2 + y^2 - 2xy}{xy} = 0$$

$$\Rightarrow \frac{(x-y)^2}{xy} = 0 \Rightarrow x=y, \quad xy \neq 0$$



$$y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{3-x}{x}}$$

$$[-\infty, 1] \cup (3, +\infty) \cap (0, 3] = [0, 1] \quad \text{الف-۱}$$

$$\frac{x-1}{x-3} \geq 0 \quad \frac{1}{+\infty - \frac{1}{3}} +$$

$$(-\infty, 1] \cup (3, +\infty)$$

$$\frac{3-x}{x} \geq 0 \Rightarrow \frac{0}{-\frac{1}{3} + 3} -$$

$$(0, 3]$$

$$\sqrt{x} + \sqrt{y-1} = \sqrt{3}$$

$$a = \sqrt{x} \quad x \geq 0 \quad b = \sqrt{y-1} \quad y-1 \geq 0 \Rightarrow y \geq 1$$

$$a+b = \sqrt{3} \quad b = \sqrt{3} - a$$

$$0 < a \leq \sqrt{3} \Rightarrow 0 \leq \sqrt{x} \leq \sqrt{3} \Rightarrow 0 \leq x \leq 3$$

$$y-1 = (\sqrt{3} - \sqrt{x})^2 \Rightarrow y = 1 + (\sqrt{3} - \sqrt{x})^2$$

$$D_f = x \in [0, 3]$$

ب

$$y = \frac{\sqrt{x^2 - 10x + 4}}{\sqrt{x^2 - 10x + 14}}$$

$$x^2 - 10x + 4 \geq 0 \Rightarrow (x-4)(x-1) \geq 0$$

$$\frac{1}{+} \frac{4}{-} \frac{1}{+} \quad (-\infty, 1] \cup [4, +\infty) \quad (\text{الف-9})$$

$$x^2 - 10x + 14 > 0 \Rightarrow$$

$$(x-2)(x-1) > 0$$

$$\frac{1}{+} \frac{2}{-} \frac{1}{+}$$

$$((-\infty, 1] \cup [4, +\infty)) \cap ((-\infty, 2) \cup (1, +\infty)) \Rightarrow \frac{(-\infty, 1) \cup (1, +\infty)}{(-\infty, 1] \cup [4, +\infty)}$$

$$y = \frac{\sqrt{x^2 - 10x + 4}}{\sqrt{x^2 - 10x + 14}} \Rightarrow \frac{x^2 - 10x + 4}{x^2 - 10x + 14} \geq 0 \Rightarrow \frac{(x-1)(x-4)}{(x-2)(x-1)} \geq 0 \quad (\text{ب-9})$$

$$\frac{1}{+} \frac{2}{-} \frac{4}{+} \frac{1}{+} \Rightarrow (-\infty, 1] \cup (2, 4] \cup (1, +\infty)$$

$$y = \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 10x + 4}}$$

$$2x^2 - 5x + 3 \geq 0 \Rightarrow x^2 - 5x + 4 \geq 0$$

$$\Rightarrow (x-1)(x-4) \geq 0 \Rightarrow (x-1)(2x-3) \geq 0 \quad (\text{الف-10})$$

$$\frac{+1}{+} \frac{3}{-} \frac{1}{+} \quad (-\infty, +1] \cup [\frac{3}{2}, +\infty)$$

$$3x^2 - 10x + 4 > 0 \Rightarrow x^2 - 10x + 14 > 0 \Rightarrow (x-2)(x-1) > 0 \Rightarrow (x-1)(2x-3) > 0$$

$$\frac{+1}{+} \frac{3}{-} \frac{1}{+} \quad (-\infty, 1) \cup (\frac{3}{2}, +\infty)$$

$$((-\infty, +1] \cup [\frac{3}{2}, +\infty)) \cap ((-\infty, 1) \cup (\frac{3}{2}, +\infty)) = (-\infty, 1) \cup [\frac{3}{2}, +\infty)$$

$$y = \frac{\sqrt{2x^2 - 5x + 3}}{\sqrt{3x^2 - 10x + 4}} \Rightarrow \frac{(x-1)(2x-3)}{(2x-3)(x-1)} \geq 0 \quad (\text{ب-10})$$

$$\Rightarrow \frac{+1}{+} \frac{3}{-} \frac{1}{-} \frac{1}{+}$$

$$(-\infty, 1) \cup (1, \frac{3}{2}) \cup [\frac{3}{2}, +\infty)$$