

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

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

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

$$m=2 \rightarrow \{(3, 4), (2, 1), (-3, 2), (-2, 2), (3, 4)\}$$

$$m=-1 \rightarrow \{(3, 1), (2, 1), (-3, -1), (-2, -1), (-1, 4)\}$$

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

$$m^2 = m+2 \rightarrow \begin{cases} m=2 \\ m=-1 \end{cases} \rightarrow \{(3, 4), (2, 1), (2, 4), (-2, 2), (-1, 4)\}$$

$$m=-1 \rightarrow \{(3, 1), (2, 1), (-1, 4), (-2, -1), (-1, 4)\}$$

بر جواب غیر قابل قبول

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

$$\begin{aligned} f(1) &= 1^2 - 1 = 0 \\ f(1) &= a + b \\ f(2) &= 2a + b \\ f(2) &= 4 \end{aligned} \rightarrow \begin{cases} a + b = 0 \\ 2a + b = 4 \end{cases} \rightarrow \begin{cases} a = 4 \\ b = -4 \end{cases}$$

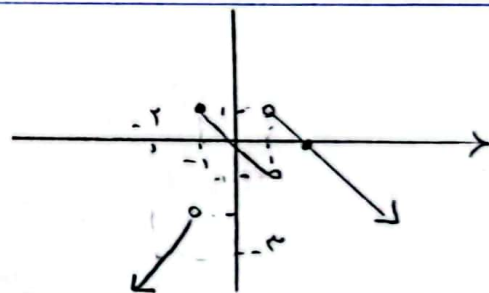
$$f(x) = \begin{cases} 2x - 3 & x \geq k \\ 4 - 3x & x \leq k \end{cases}$$

$$f(k) = 2k - 3$$

$$f(k) = 4 - 3k$$

$$2k - 3 = 4 - 3k \Rightarrow 5k = 7 \Rightarrow k = \frac{7}{5}$$

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



$$2y^2 + x^2 + 1 = 0 \xrightarrow{x=1} 2y^2 = -2 \rightarrow y^2 = -1 \rightarrow y = -1$$

$$x^2 + 4y^2 - 2x - 12y + 10 = 0 \rightarrow (x^2 - 2x + 1) + (4y^2 - 12y + 9) = 0$$

$$(x-1)^2 + (2y-3)^2 = 0 \rightarrow \begin{cases} x-1=0 \rightarrow x=1 \\ 2y-3=0 \rightarrow y=\frac{3}{2} \end{cases} \rightarrow (1, \frac{3}{2})$$

الف) $x \sin y = y \sin x \xrightarrow{x=0} 0=0$

جواب بیست آمده رابطه بین سینت و کسینت و به ازای سینت مقدار برابر را بیست و چهار به برش داریم
سبب تابع سینت

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

$\sqrt{\frac{x}{y}} = t > 0, \sqrt{\frac{y}{x}} = \frac{1}{t}$
 $\left\{ \frac{x}{y} > 0, \frac{y}{x} > 0 \right\} \rightarrow \left\{ \frac{x}{y} > 0, \frac{y}{x} > 0 \right\} \rightarrow \left\{ \frac{x}{y} > 0, \frac{y}{x} > 0 \right\}$

$\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \rightarrow t + \frac{1}{t} = 2 \rightarrow t = 1 \Rightarrow \sqrt{\frac{x}{y}} = 1 \rightarrow \frac{x}{y} = 1 \rightarrow x = y$

به ازای هر نقطه (x, y) در رابطه داریم $x = y$ است

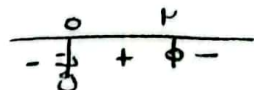
الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{2-x}{x}}$

$\frac{x-1}{x-3} \geq 0 \rightarrow \begin{cases} x=1 \\ x=3 \end{cases}$



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

$\frac{2-x}{x} \geq 0 \rightarrow \begin{cases} x=2 \\ x=0 \end{cases}$



$(0, 2]$

$D = (0, 1]$

ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{3}$

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

$\begin{cases} y \geq 1 \\ x \geq 0 \end{cases}$

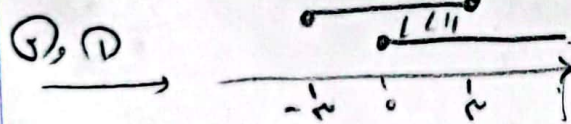
①

$\sqrt{x} + \sqrt{3} \geq 0 \rightarrow$

$\sqrt{x} \leq \sqrt{3} \rightarrow x \leq 3$

$-3 \leq x \leq 3$

②



$D = [0, 3]$

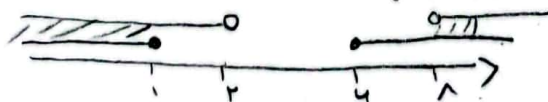
الف) $y = \frac{\sqrt{x^2 - 7x + 4}}{\sqrt{x - 10x + 14}}$

$x^2 - 7x + 4 \geq 0 \rightarrow (x-1)(x-4) = 0 \rightarrow \begin{cases} x=1 \\ x=4 \end{cases}$

$x^2 - 10x + 14 \geq 0 \rightarrow (x-2)(x-7) = 0 \rightarrow \begin{cases} x=2 \\ x=7 \end{cases}$

$(-\infty, 1] \cup [4, +\infty)$

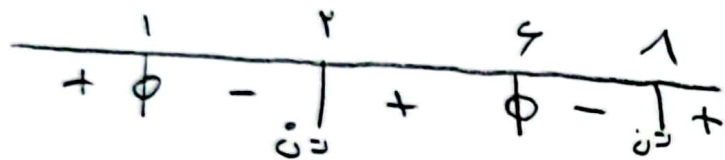
$(-\infty, 2] \cup (7, +\infty)$



$D = (-\infty, 1] \cup (4, +\infty)$

$$b) y = \sqrt{\frac{x^2 - vx + 4}{x^2 - 1 \cdot x + 4}} \Rightarrow \frac{x^2 - vx + 4}{x^2 - 1 \cdot x + 4} > 0$$

$$x^2 - vx + 4 = 0 \rightarrow \begin{cases} x=1 \\ x=4 \end{cases} \quad , \quad x^2 - 1 \cdot x + 4 = 0 \rightarrow \begin{cases} x=2 \\ x=1 \end{cases}$$

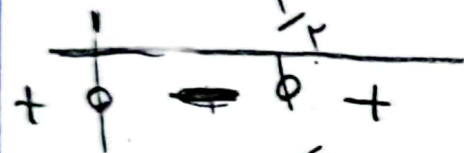


$$D_f = (-\infty, 1] \cup (2, 4] \cup (1, +\infty)$$

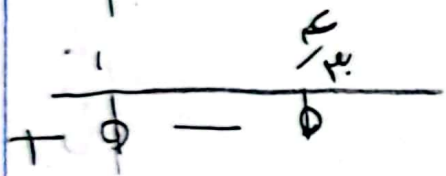
$$c) y = \sqrt{\frac{rx^2 - ax + r}{\mu x^2 - vx + k}}$$

$$rx^2 - ax + r \geq 0 \rightarrow r + r - a = 0 \rightarrow \begin{cases} x_1 = 1 \\ x_2 = \frac{r}{a} = \frac{r}{r} = 1 \end{cases}$$

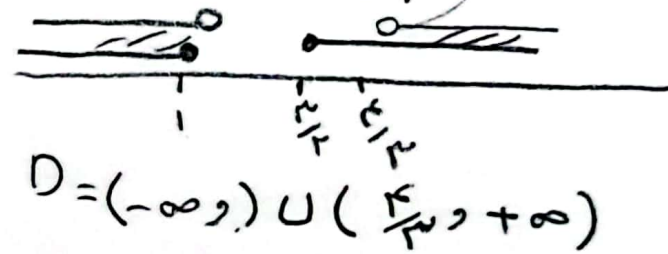
$$\mu x^2 - vx + k \geq 0 \rightarrow \begin{cases} x_1 = 1 \\ x_2 = \frac{k}{\mu} = \frac{r}{r} = 1 \end{cases}$$



$$(-\infty, 1] \cup [\frac{r}{r}, +\infty)$$



$$(-\infty, 1) \cup (\frac{r}{r}, +\infty)$$



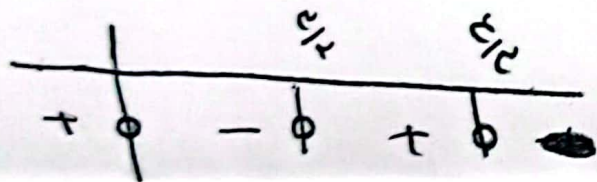
$$D = (-\infty, 1) \cup (\frac{r}{r}, +\infty)$$

$$b) y = \sqrt{\frac{rx^2 - ax + r}{\mu x^2 - vx + k}}$$

$$\frac{rx^2 - ax + r}{\mu x^2 - vx + k} \geq 0$$

$$x_1 = 1, x_2 = \frac{r}{r} = 1$$

$$x_3 = \frac{r}{r}$$



$$(-\infty, 1) \cup [\frac{r}{r}, \frac{r}{r}]$$