

۱۷

پاسخنامه تشریحی تکلیف شماره ۱ کلاس به شنبه ها دفتر شایسته جعفری

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

$$A \times B - B^2$$

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

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

(C)

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

$$m^2 = m+2 \quad m^2 - m - 2 = 0 \quad (m-2)(m+1) = 0 \quad m=2 \vee m=-1$$

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

if $m=-1 \rightarrow (2, 1), (2, 1), (-3, -1), (2, 1), (-1, 4)$ ✓ m = -1

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

$$m^2 - m - 2 = 0 \quad (m-2)(m+1) = 0 \quad m=2 \vee m=-1$$

if $m=2 \rightarrow (2, 4), (2, 1), (2, 4), (2, 4), (-2, 2), (-1, 4)$

if $m=-1 \rightarrow (2, 1), (2, 1), (-1, 4), (-1, 4), (2, 1), (-2, -1)$

به اشیاء هیچ وجه

$$a \times b = ?$$

$$\text{if } n=1 \quad x^2 - 1 = an + b \Rightarrow 1 - 1 = a + b = 0$$

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

$$\text{if } n=2 \quad an + b = x^2 \Rightarrow 2a + b = 1$$

$$\begin{cases} 2a + b = 1 \\ a + b = 0 \end{cases}$$

$$a \times b = 1 \times (-1) = -1$$

$$a = 1 \quad , \quad b = -1$$

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

$$\rightarrow \begin{cases} x \geq \frac{k}{5} \\ x \leq \frac{k}{5} \end{cases}$$

$$2x - 3 = k - 3x$$

$$5x = k$$

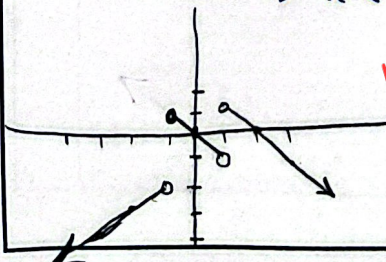
$$x = \frac{k}{5} = k$$

$$f(x) = \begin{cases} -x+2 & ; x > 1 \rightarrow \begin{matrix} + & 1 & 2 & 3 \\ - & 1 & 0 & -1 \end{matrix} \\ -x & ; -1 \leq x \leq 1 \rightarrow \begin{matrix} + & -1 & 0 & -1 \\ - & -1 & 0 & -1 \end{matrix} \\ x-1 & ; x < -1 \rightarrow \begin{matrix} + & -1 & -2 & -3 \\ - & -1 & -2 & -3 \end{matrix} \end{cases}$$

$$D_f = \mathbb{R} - \{1\}$$

$$R_f = [-\infty, 1]$$

شکل داده شده



(C)

$$\text{الف) } x^2 + y^2 + 1 = 0$$

$$y^2 = -x^2 - 1$$

$$y^2 = -x^2 - 1$$

$$y^2 = x^2$$

$$y_1 = y_r$$

لا يوجد حُل

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

$$x^2 + y^2 - 2x - 1y + 1 + 9 = 0$$

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

$$x-1=0 \quad x=1$$

$$y+\frac{1}{2}=0 \quad y=-\frac{1}{2}$$



لا يوجد حُل

$$\text{الف) } x \sin y = y \sin x$$

$$\frac{\sin y}{y} = \frac{\sin x}{x}$$

أجزاء طرف
واسطى صفر
بعض

$$\frac{\sin y}{y} = 0$$

$$\sin y = 0$$

$$y = 0, \pi, 2\pi, \dots$$

لا يوجد حُل

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

بضرب

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

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

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

$$(x-y)^2 = 0 \Rightarrow y = x$$

لا يوجد حُل

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

$$x-2 \neq 0$$

$$x \neq 2$$

$$\frac{x-1}{x-2} \geq 0 \quad \frac{1}{x-2} \geq 0$$

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

$$\text{①} \cap \text{②} \rightarrow (0, 1] = D_f$$

1

$$\text{ب) } \sqrt{x} + \sqrt{y-1} = \sqrt{2}$$

$$\sqrt{y-1} = \sqrt{2} - \sqrt{x}$$

$$x \geq 0 \quad [0, +\infty) = D_f$$

$$\sqrt{y-1} = \sqrt{2} - \sqrt{x}$$

$$\sqrt{2} - \sqrt{x} \geq 0 \rightarrow x \leq 2$$

$$0 \leq x \leq 2$$

$$\text{الف) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} = \sqrt{\frac{(x-1)(x-4)}{(x-1)(x-9)}}$$

$$\text{①} A \rightarrow (-\infty, 1] \cup (4, +\infty) = D_f$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0 \quad (-\infty, 1] \cup (4, +\infty)$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0 \quad (-\infty, 1] \cup (4, +\infty)$$

$$\text{ب) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} = \sqrt{\frac{(x-1)(x-4)}{(x-1)(x-9)}}$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0$$

$$D_f = (-\infty, 1] \cup (4, 9] \cup (19, +\infty)$$

1, 10

$$\text{الف) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} \rightarrow (x-1)(x-4) \rightarrow x = \frac{5}{2} = 2.5$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0 \quad (-\infty, 1] \cup (\frac{5}{2}, +\infty)$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0 \quad (-\infty, \frac{5}{2}) \cup (9, +\infty)$$

$$D_f = (-\infty, 1] \cup (\frac{5}{2}, 9] \cup (19, +\infty)$$

$$\text{ب) } y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}} = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 10x + 14}}$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0$$

$$D_f = (-\infty, 1] \cup (9, +\infty)$$

$$\frac{1}{x-1} + \frac{1}{x-4} + \frac{1}{x-9} \geq 0$$

$$D = (-\infty, 1] \cup (1, \frac{5}{2}) \cup (\frac{5}{2}, 9] \cup (9, +\infty)$$

1, 10