

$$A = \{1, 2, 3\}$$

$$B = \{2, 3\}$$

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

$$B^2 \rightarrow B \times B = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$$

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

(۲)

$$1) f(n) = \{(n, m+2), (n, 1), (n, m), (-n, m), (n, m+2), (m, 2)\}$$

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

(۱)

$$2) g(n) = \{(n, m+2), (n, 1), (m, 2), (n, m+2), (-n, m), (-n, 3)\}$$

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

هر دو غلط

$$f(n) = \begin{cases} n^2 - 1 & n \leq 1 \\ an + b & 1 \leq n \leq 2 \\ n^3 & n \geq 2 \end{cases}$$

$$\begin{cases} a + b = 1 \\ a + b = 0 \\ \hline a = 1 \rightarrow b = -1 \end{cases}$$

(۲)

$$n = 1 \rightarrow 0 \leq 1(a) + b$$

$$n = 2 \rightarrow 2^3 = 8 = 2(a) + b$$

$$a + b \rightarrow 1x - 1 = -1$$

$$f(n) = \begin{cases} kn - 3 & n \geq k \\ \varepsilon - kn & n \leq k \end{cases}$$

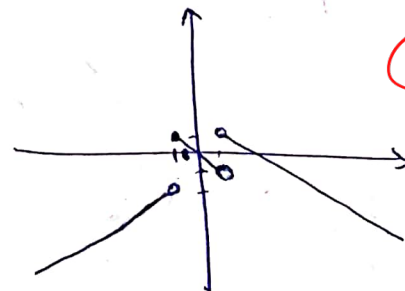
$$n = k \rightarrow kn - 3 = \varepsilon - kn$$

$$\delta k = 6 \rightarrow k = \frac{6}{\delta}$$

(۲)

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

n	2	1	0	-1	-2
f(n)	1	1	0	-1	-2



(۱, ۵)

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

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

الف) $xy^2 + x^2 + 1 = 0 \rightarrow xy^2 = -x^2 - 1 \rightarrow \begin{cases} xy^2 = -x^2 - 1 \\ xy^2 = -x^2 - 1 \end{cases} \rightarrow xy^2 = -x^2 - 1 \rightarrow y^2 = -x - \frac{1}{x} \rightarrow y = \pm \sqrt{-x - \frac{1}{x}}$ ✓
 تابع است با تعریف ریاض ✓

ب) $x^2 + 4y^2 - 2x - 12y + 10 = 0$

$x=0$

$(x-1)^2 + (2y-3)^2 = 0 \rightarrow (\frac{3}{2}, 1)$
 تابع است نقطه

با 2 نقطه $\Delta < 0$ و $\Delta = 0$ در آن تابع نیست (1)

$0 + 4y^2 - 0 - 12y + 10 = 0 \rightarrow 4y^2 - 12y + 10 = 0 \rightarrow \Delta = 144 - 160 = -16 < 0$
 $x=1 \rightarrow 1 + 4y^2 - 2 - 12y + 10 = 0 \rightarrow 4y^2 - 12y + 9 = 0 \rightarrow \Delta = 144 - 144 = 0$ ✓

الف) $u \cdot \sin y = y \cdot \sin u$

$u=0 \rightarrow 0 \cdot \sin y = y \cdot 0 \rightarrow y = 0$ یا $y = \pi$ ✓

(1, 25)

ب) $\int \frac{u}{y} + \int \frac{y}{u} = 2 \rightarrow \frac{u}{y} = 1 \rightarrow u = y / u, y \neq 0$ تابع است

$u=0$

$\rightarrow 0 + 2 = 2 \rightarrow 0 = 2 \rightarrow \phi$ ✓

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

ب) $\sqrt{u} + \sqrt{y-1} = \sqrt{3}$

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$\sqrt{y-1} = \sqrt{3} - \sqrt{u} \rightarrow y-1 = 3 - 2\sqrt{3u} + u \rightarrow y = -2\sqrt{3u} + u + 4$
 $u \geq 0 \rightarrow y \geq 0$

$\frac{u-1}{u-3} \geq 0 \rightarrow \frac{1}{u-3} \rightarrow (-\infty, 3) \cup (3, +\infty)$

$\frac{2-u}{u} \geq 0 \rightarrow \frac{2}{-u+2} \rightarrow (0, 2]$ ✓

$\sqrt{3} - \sqrt{u} \geq 0 \rightarrow u \leq 3 \rightarrow D = [0, 3]$
 $[0, +\infty)$

الف) $y = \sqrt{u^2 - u + 5} \geq 0 \rightarrow (u-4)(u-1) \geq 0 \rightarrow \frac{1}{u-1} \rightarrow (-\infty, 4] \cup [1, +\infty)$
 $y = \sqrt{u^2 - u + 14} \geq 0 \rightarrow (u-1)(u-2) \geq 0 \rightarrow \frac{2}{u-1} \rightarrow (-\infty, 2] \cup (1, +\infty)$
 $-9u + 14 \geq 0 \rightarrow u \leq \frac{14}{9}$
 $D = (-\infty, 1] \cup [2, +\infty)$
 $D = (-\infty, 1] \cup [2, \frac{14}{9}] \cup (1, +\infty)$

ب) $\sqrt{\frac{u^2 - u + 5}{u^2 - u + 14}} \rightarrow \frac{(u-4)(u-1)}{(u-1)(u-2)} \rightarrow \frac{1}{u-2} \rightarrow (-\infty, 1] \cup [2, +\infty) \cup (1, +\infty)$ ✓
 (1, 25)

الف) $\sqrt{u^2 - u + 5} \geq 0 \rightarrow (u-4)(u-1) \geq 0 \rightarrow \frac{1}{u-1} \rightarrow (-\infty, 4] \cup [1, +\infty)$
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 $D = (-\infty, 1] \cup [2, \frac{14}{9}] \cup (1, +\infty)$

ب) $y = \sqrt{\frac{u^2 - u + 5}{u^2 - u + 14}} \rightarrow \frac{u^2 - u + 5}{u^2 - u + 14} \rightarrow \frac{(u-4)(u-1)}{(u-1)(u-2)} \geq 0 \rightarrow \frac{1}{u-2} \rightarrow (-\infty, 1] \cup [2, +\infty) \cup (1, +\infty)$ ✓
 (1, 25)