

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

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

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

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

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

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

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

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

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

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

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

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

$$n \leq 2 \rightarrow 2^3 = 1 = 2(a) + b$$

$$a + b \rightarrow 1 + (-1) = 0$$

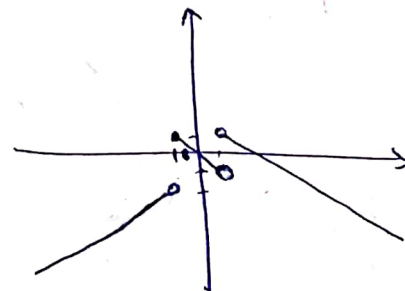
$$f(n) = \begin{cases} kn - 3 & n \geq k \\ 2 - kn & n \leq k \end{cases}$$

$$n = k \rightarrow kn - 3 = 2 - kn$$

$$\delta k = 5 \rightarrow k = \frac{5}{\delta}$$

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

n	1	2	3	4
f(n)	1	0	-1	-2



$$D_f = \mathbb{R}$$

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

الف) $xy^2 + u^2 + 1 = 0 \quad xy^2 = -u^2 - 1 \rightarrow \begin{cases} xy^2 = -u^2 - 1 \\ xy^2 = -u^2 - 1 \end{cases} \rightarrow xy^2 = xy^2 \rightarrow y^2 = y^2 \rightarrow y = y$ ✓
تابع است با تقریب ریاضی

ب) $u^2 + xy^2 - 2u - 12y + 10 = 0$
 $u=0$

با مثال نقطه $\Delta < 0$ و $\Delta = 0$ در آن تابع نیست

$0 + xy^2 - 12y + 10 = 0 \rightarrow xy^2 - 12y + 10 = 0 \rightarrow \Delta = 144 - 4(10)(1) = 144 - 40 = 104 > 0$
 $u=1, 1 + xy^2 - 2 - 12y + 10 = 0 \rightarrow xy^2 - 12y + 9 = 0 \rightarrow \Delta = 144 - 4(9)(1) = 144 - 36 = 108 > 0$ ✗

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

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

ب) $\int \frac{u}{y} + \int \frac{y}{u} = 2$

$u=0 \rightarrow 0 + \int \frac{y}{0} = 2 \rightarrow 0 = 2 \rightarrow \phi \rightarrow$ تابع صحیح ✓

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

ب) $\sqrt{u} + \sqrt{u-1} = \sqrt{3}$

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

$\frac{u-1}{u-2} \geq 0 \rightarrow \frac{1}{u-2} \rightarrow (-\infty, 2) \cup (2, +\infty)$

$\frac{2-u}{u} \geq 0 \rightarrow \frac{2}{-1+u} \rightarrow (0, 2]$ $[0, 2]$

$[0, +\infty)$

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

$\sqrt{u^2 - u + 5} > 0 \rightarrow (u-1)(u-4) > 0 \rightarrow \frac{1}{u-1} \rightarrow (-\infty, 1) \cup (4, +\infty)$

ب) $(-\infty, 1] \cup [4, +\infty)$

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

الف) $\sqrt{u^2 - u + 4} \rightarrow (u-3)(u-2) \geq 0 \rightarrow \frac{1}{u-2} \rightarrow (-\infty, 2] \cup [3, +\infty)$

اول بار پس از آنکه، تقسیم علامت می‌کنیم
 $\frac{3}{2} > \frac{2}{2} > \frac{2}{2}$

$\frac{u^2 - u + 4}{u^2 - u + 4} \rightarrow \frac{1}{u-2}$

$(-\infty, 2] \cup [3, +\infty)$
 $(-\infty, 2) \cup (3, +\infty)$

$(-\infty, 2) \cup [3, +\infty)$

ب) $y = \sqrt{\frac{u^2 - u + 4}{u^2 - u + 4}} \rightarrow \frac{u^2 - u + 4}{u^2 - u + 4} \rightarrow \frac{(u-3)(u-2)}{(u-2)(u-3)} \geq 0 \rightarrow \frac{1}{u-3} \rightarrow (-\infty, 3] \cup [4, +\infty)$

$(-\infty, 3] \cup [4, +\infty)$