

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

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

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

الف) $n^2 = n+2 \Rightarrow n^2 - n - 2 = 0$
 $(n-2)(n+1) = 0$
 $n = -1$
 $f(n) = \{(3,1), (2,1), (-2,-1), (-2,-1), (3,1), (-1,4)\}$

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ب) $n^2 = n+2 \Rightarrow n^2 - n - 2 = 0$
 $(n-2)(n+1) = 0$
 $n = 2, n = -1$

$g(n) = \{(3,4), (2,1), (2,4), (3,4), (-1,4)\}$
 این عبارت به ازای هیچ مقادیر n صحیح نیست

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

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

$n=2 \Rightarrow 1 = 2a+b$

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

$$\begin{aligned} a &= 1 \\ b &= -1 \end{aligned}$$

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

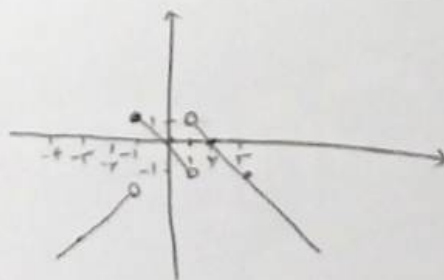
$$f(n) = \begin{cases} 2n-2 & ; n \geq 2 \\ 4-2n & ; n \leq 2 \end{cases}$$

$n=k \Rightarrow 2k-2 = 4-2k$
 $2k = 6$
 $k = \frac{6}{2}$

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

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

$R_f = (-\infty, 1]$



الف) $y'' + m^2 y + 1 = 0$ $y'' = -m^2 y - 1$ $y'' = -m^2 y - 1$ $x y' = x y''$ $y_1 = y_2 \checkmark$ $\Rightarrow$ ع.ل	ب) $m^2 + ky^2 - 2m - 12y + 10 = 0$ $m^2 - 2m + 1 + ky^2 - 12y + 9 = 0$ $(m-1)^2 + (ky-3)^2 = 0$ $\left. \begin{matrix} m=1 \\ y=\frac{3}{k} \end{matrix} \right\} \Rightarrow \left \begin{matrix} 1 \\ \frac{3}{k} \end{matrix} \right$ ع.ل	8
الف) $x \sin y = y \sin x$ $m \Rightarrow \rightarrow x \sin y = y \sin x$ ب) $y = m x$ $\Rightarrow$ $x \sin y = y \sin x$ ب) $y = m x$ $\Rightarrow$ $x \sin y = y \sin x$	ب) $\sqrt{\frac{m}{y}} + \sqrt{\frac{y}{m}} = 2$ (1) $\frac{m}{y} + \frac{y}{m} + 2\sqrt{\frac{y}{m} \cdot \frac{m}{y}} = 4$ $\frac{m}{y} + \frac{y}{m} = 2$ $\Rightarrow \left(\begin{matrix} 1 \\ 1 \end{matrix} \right)$ ع.ل	7
الف) $y = \sqrt{\frac{m-1}{m-2}} + \sqrt{\frac{2-m}{m}}$ $\frac{1}{\sqrt{m-2}} + \frac{1}{\sqrt{m}}$ $\frac{1}{\sqrt{m-2}} + \frac{1}{\sqrt{m}}$ $(-\infty, 1) \cup (2, +\infty)$ $D_f = (0, 1]$	ب) $\sqrt{m} + \sqrt{y-1} = \sqrt{2}$ $\sqrt{y-1} = \sqrt{2} - \sqrt{m}$ $\boxed{m \geq 0}$ $y-1 \geq 0 \Rightarrow \boxed{y \geq 1}$ $\sqrt{2} - \sqrt{m} \geq 0 \Rightarrow \sqrt{2} \geq \sqrt{m} \Rightarrow \boxed{2 \geq m}$ $D_f: [0, 2]$	1
الف) $\frac{\sqrt{m^2 - 6m + 4}}{\sqrt{m^2 - 6m + 14}}$ $(m-1)(m-4) \geq 0$ $(-\infty, 1] \cup [4, +\infty)$ (A) $(m-2)(m-1) \geq 0$ $(-\infty, 2) \cup (1, +\infty)$ (B) $(A) \cap (B) \Rightarrow (-\infty, 2) \cup (1, +\infty)$	ب) $\frac{\sqrt{m^2 - 6m + 4}}{\sqrt{m^2 - 6m + 14}}$ $(m-1)(m-4) \geq 0$ $(-\infty, 1] \cup [4, +\infty)$ $(-\infty, 1] \cup (2, 4) \cup (1, +\infty)$	9
الف) $\frac{\sqrt{4m^2 - 8m + 3}}{\sqrt{4m^2 - 8m + 5}}$ $(m-1)(2m-3) \geq 0$ $(-\infty, 1] \cup [\frac{3}{2}, +\infty)$ (I) $(m-1)(2m-5) \geq 0$ $(-\infty, 1) \cup (\frac{5}{2}, +\infty)$ (II) $(I) \cap (II) \Rightarrow (-\infty, 1) \cup [\frac{5}{2}, +\infty)$	ب) $\frac{\sqrt{4m^2 - 8m + 3}}{\sqrt{4m^2 - 8m + 5}}$ $(m-1)(2m-3) \geq 0$ $(-\infty, 1] \cup [\frac{3}{2}, +\infty)$ $(-\infty, \frac{3}{2}) - \{1\} \cup [\frac{5}{2}, +\infty)$	10