

الف) $y_1'' = 4x_1^2 + 4x_1 - 1$ if $m_1 = m_2$ $y_1''' = y_2''' \rightarrow \sqrt{y_1} = \sqrt{y_2} \rightarrow y_1 = y_2 \checkmark \checkmark$ (r)

ب) $\cos y = y \cos \frac{\pi}{2} \rightarrow \frac{\pi}{2} \cos y = 0 \rightarrow \cos y = 0 \rightarrow y = \frac{\pi}{2} + k\pi$

ج) $\frac{x+y}{2} \geq \sqrt{xy}$ $\rightarrow$ میانگین حسابی بزرگتر از میانگین هندسی است $\rightarrow m = y \checkmark$

د) $xy^2 + 4m - y^3 - 2y = 0 \rightarrow x(y^2 + 2) - y(y^2 + 2) = 0 \rightarrow (y^2 + 2)(x - y) = 0 \rightarrow x - y = 0 \rightarrow x = y \checkmark$

الف) $|y| + m^2 = 2y$ $\xrightarrow{y \geq 0} y + m^2 = 2y \rightarrow y = m^2$ $\xrightarrow{y < 0} -y + m^2 = 2y \rightarrow m^2 = 3y \rightarrow y = \frac{m^2}{3}$ (r)

$[y] + [a] = 1$ $\rightarrow$ $n = 0, 1 \rightarrow [0, 1] = 0 \rightarrow [y] = 1 \rightarrow 1 \leq y < 2$

$|a-1| \geq 2 \rightarrow a-1 \geq 2 \rightarrow a \geq 3$ $\rightarrow$ $a-1 \leq -2 \rightarrow a \leq -1$ $\Rightarrow a = 3$ $\Rightarrow \begin{cases} 4x^2 - b & a=3 \\ a+4m & a=-1 \end{cases}$ $\rightarrow a+b=12 \leftarrow 11-b=a+4$ (r)

$-a^2 - b + a \geq 0$ $\xrightarrow{\frac{a}{b}}$ $-a^2 - ab + a \xrightarrow{x-1}$ $a^2 + ab - a = 0$ $\Rightarrow a^2 - 2b^2 + ab = 0 \rightarrow a^2 + ab - 2b^2 = 0$ $\rightarrow (a+b)(a-b) = 0 \rightarrow a=b$ $\rightarrow a+b=1 \rightarrow a=2, b=-1$ (r)

$ax^2 + bx + c > 0$ $\xrightarrow{(-\infty, 2)}$ $a=0$ $b=0$ $\rightarrow b < 0$ (r) $\rightarrow 2b+c=0 \rightarrow c=-2b$ $\rightarrow 3a+c-3|b|$ $\xrightarrow{b < 0, a=0}$ $-2b-3(-b) = 0 \rightarrow -2b+3b = b$ (r)

$\frac{3m+2}{a+b} + c > 0 \rightarrow \frac{3m+2+a(m+b)}{a+b} > 0 \rightarrow \frac{(3+a)m + (2+ab)}{a+b} > 0$ $D = (2, -\infty)$ (r) $\rightarrow a = -3 \leftarrow 3a = 0$ $\rightarrow \frac{2-3b}{a+b} > 0$ $\rightarrow n \neq b \rightarrow b = -2$

الف) $y = \sqrt{x^3 - x} \Rightarrow x^3 - x \geq 0$
 ب) $y = \frac{1}{\sqrt{|x| - 1}} \Rightarrow |x| - 1 > 0 \Rightarrow |x| > 1 \Rightarrow x > 1 \text{ or } x < -1$ ✓

$x(x^2 - 1) \geq 0 \Rightarrow \frac{-1}{x+1} \cdot \frac{1}{x-1} \rightarrow [-1, 0] \cup [1, +\infty)$ (r) (v)

الف) $y = \sqrt{\frac{1}{|x| - [x]}}$ $|x| \neq [x] \rightarrow$ دالة غير مستمرة $\rightarrow D = \mathbb{R} - \{x \geq 0 \mid x \in \mathbb{Z}\}$ (r) (1)

ب) $\sqrt{x} + \sqrt{y} = 9$ $x \geq 0, y \geq 0 \Rightarrow \sqrt{x} \leq 9 \Rightarrow x \leq 81$ and $x \geq 0 \rightarrow [0, 81]$ ✓

$y = \frac{1}{\sqrt{(x+\frac{1}{p}) + (x+\frac{p}{p})}} \Rightarrow [x - \frac{1}{p}] + [x + \frac{p}{p}] > 0$ (r) (v)

$2[x - \frac{1}{p}] + 1 > 0 \Rightarrow 2[x - \frac{1}{p}] > -1 \Rightarrow [x - \frac{1}{p}] > -\frac{1}{2}$

$x > \frac{1}{2} \leftarrow x - \frac{1}{p} \geq 0$

$y = \sqrt{1 - \log(x-a)}$ 1) $x - a > 0 \Rightarrow x > \frac{a}{p}$ (r) (6)

2) $1 - \log(x-a) \geq 0 \Rightarrow \log(x-a) \leq 1 \rightarrow x - a \leq 10$

$\frac{a}{p} < x \leq a + \frac{a}{p} \Rightarrow a + \frac{a}{p} - \frac{a}{p} = a$ ✓

$x \leq 10 + a \rightarrow x \leq a + \frac{a}{p}$