

سوال ۱۰

(A) داندو درجه ۳

الف) $y''' - 2ay'' = 2a - 1 \rightarrow y''' - 2ay'' + 2a - 1 = 0$

$y''' = 2ay'' + 2a - 1$
 $y''' - 2ay'' + 2a - 1 = 0 \rightarrow y_1''' = y_2''' \rightarrow y_1 = y_2$

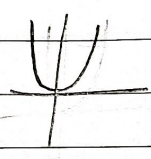
توجه: ①

ب) $a \cos y = y \cos ay \rightarrow a = \pi \rightarrow \cos \pi = -1 \rightarrow -y \cos y$
 $\cos \frac{\pi}{2} = 0$

ج) $\frac{u+y}{y} = \sqrt{ay} \rightarrow u+y - \sqrt{ay} = 0 \rightarrow (\sqrt{u}-\sqrt{y})^2 = 0 \rightarrow \sqrt{u} = \sqrt{y} \rightarrow u=y$

د) $ay'' + 2a - y' - 2y = 0 \rightarrow a(y''+2) - y(y'+2) = 0$
 $(y'+2)(a-y) = 0 \rightarrow a=y$

الف) $|y| + ay = ay \begin{cases} y > 0 \rightarrow y = ay \\ y < 0 \rightarrow y = ay \end{cases}$



ب) $[y] + [a] = 1$
 $a = -1 \rightarrow [a] = 0 \rightarrow [y] = 1 \rightarrow y \in (1, 2]$

f(m) $\begin{cases} ay^2 - b & |a-1| \geq 1 \\ a+2m & 0 \leq m \leq 3 \end{cases} \quad a+b=?$

$f(m) = \sqrt{a-ba-ay^2} \quad D_f = [a, b] \quad a \neq 0, b \in \mathbb{Z} \quad a+b=?$
 $S = a+b = \frac{-b}{a} = \frac{-(-b)}{-1} = -b \quad a+b = -b \rightarrow a = -2b \rightarrow a = -2(-1) = +2$
 $D = ab = \frac{c}{a} = \frac{a}{-1} = -a \quad ab = -a \rightarrow b = -1 \quad a+b = 2-1 = 1$

$y = \frac{r}{\sqrt{ay^2 + by + c}} \quad D_f = (-\infty, 2) \quad 3a+c-3|b|$
 $3a+c-3|b| = -2b+3b = +b$
 $b \leq 0 \rightarrow -3|b| = +3b$

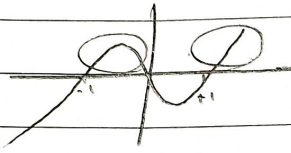
$y = \sqrt{\frac{3ay^2}{a+b} + a} \quad (r, +\infty) \quad b=?$
 $\frac{3ay^2 + r + a(a+b)}{a+b} = \frac{3ay^2 + r + ay + ab}{a+b} = \frac{a(3y^2+a) + r+ab}{a+b}$
 $a+b=0 \rightarrow a=-b$
 $b = +$

ii) $y = \sqrt{a^2 - x}$ $D_y = [-1, 0] \cup [1, +\infty)$

$a(a^2 - 1) \geq 0 \rightarrow a(a-1)(a+1) \geq 0$

$\Rightarrow y = \frac{1}{\sqrt{|x| - 1}}$

$\sqrt{|x| - 1} \geq 0 \rightarrow |x| - 1 \geq 0 \rightarrow |x| \geq 1 \rightarrow x \geq 1$
 $D_y = (-\infty, -1) \cup (1, +\infty)$



iii) $y = \sqrt{\frac{1}{|x| - [a]}}$ $|a| \neq [a]$
 $D_y = \mathbb{R} - \mathbb{W}$

$\Rightarrow \sqrt{x} + \sqrt{y} = a$ $\sqrt{x} = a - \sqrt{y}$ (A)
 $\sqrt{y} = a - \sqrt{x}$ $a - \sqrt{x} \geq 0$
 $a \geq \sqrt{x} \rightarrow -1 \leq x \leq 1$ II
 $\sqrt{x} \leq a$ $I \cap II \rightarrow D_y = [-1, 1]$

$y = \frac{1}{[x - \frac{1}{r}] + [x + \frac{r}{r}]}$

$[x - \frac{1}{r}] + [x + \frac{r}{r}] + 1 \geq 0$

$[x - \frac{1}{r}] \geq -1 \rightarrow [x - \frac{1}{r}] \geq -1$

$x - \frac{1}{r} \geq 0 \rightarrow x \geq \frac{1}{r} \rightarrow x \geq \frac{1}{r} \rightarrow D_y = [\frac{1}{r}, +\infty)$

$y = \sqrt{1 - \log(x - a)}$ $D_y = (b, c)$ $c - b = ?$

$x - a \geq 0 \rightarrow x \geq a \rightarrow a \geq \frac{1}{r}$

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

$x - a \leq 10 \rightarrow x \leq \frac{10 + a}{r}$

$\frac{1}{b} \leq x \leq \frac{10 + a}{c}$

$c - b = \frac{10 + a}{r} - \frac{a}{r} = \frac{10}{r}$

$c - b = \frac{10}{r} = (10)$