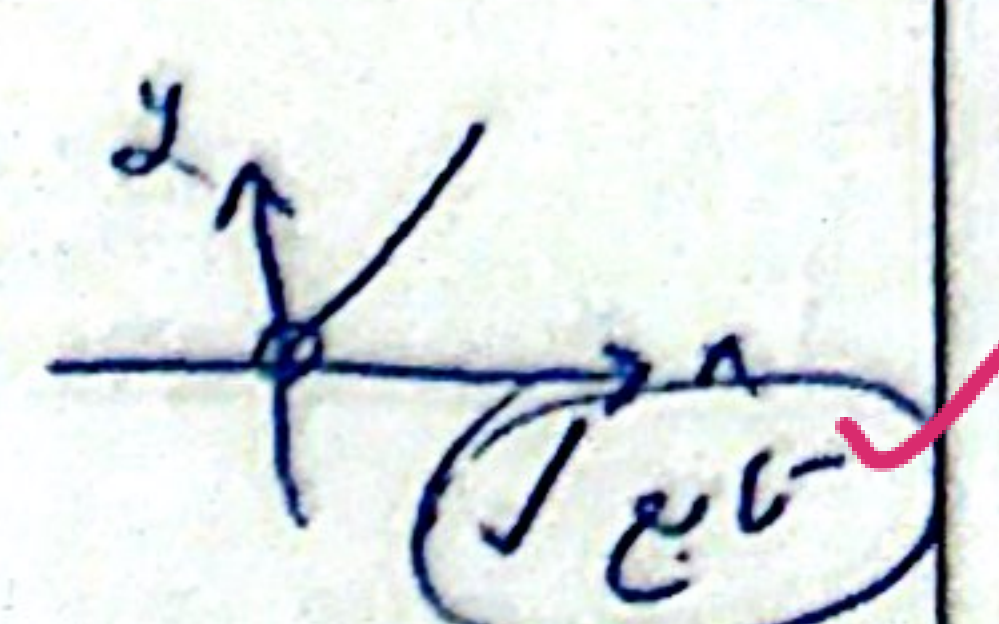


الف) $y^3 - 2y^2 + 2y - 1 \rightarrow y^3 - 2y^2 + 2y - 1 \xrightarrow{y_1 = y_2} y^3 - 2y^2 + 2y - 1$ $\rightarrow y_1 = y_2$ $\rightarrow$ تابع ✓

ب) $n \cos y = y \cos n \xrightarrow{n = \frac{\pi}{2}} \frac{\pi}{2} \cos y = 0$
 $\cos y = 0 \rightarrow y = k\pi + \frac{\pi}{2} : \frac{\pi}{2}, \frac{3\pi}{2}, \dots$ $\rightarrow$ تابع ✗

ج) $\frac{n+y}{2} = \sqrt{ny} \xrightarrow{n, y > 0} n+y - 2\sqrt{ny} = 0$
 $(\sqrt{n} - \sqrt{y})^2 = 0 \rightarrow \sqrt{n} = \sqrt{y} \rightarrow n = y$ $n, y > 0$ $\rightarrow$ تابع ✓

د) $xy^2 + 2x - y^3 - 2y = 0 \rightarrow x = \frac{y^3 + 2y}{y^2 + 2} \rightarrow x = y$ $\rightarrow$ تابع ✓



الف) $|x^2 + 1| = 2y$
 $x^2 + 1 = 2y$ $\rightarrow x^2 = 2y - 1$ $\rightarrow$ تابع ✓

ب) $[y] + [x] = 1$
 $x = 0 \rightarrow [y] = 1 \rightarrow 1 \leq y < 2 \rightarrow$ تابع ✓

$f(n) = \begin{cases} 2n^2 - b & |n-1| \geq 2 \\ a + 2n & 1 \leq n \leq 3 \end{cases}$
 $|n-1| \geq 2 \rightarrow n \geq 3 \text{ or } n \leq -1$
 $n \geq 3 \rightarrow 2n^2 - b = a + 2n \rightarrow 2n^2 - 2n - b = a$
 $n = 3 \rightarrow 12 - 6 - b = a \rightarrow a = 6 - b$ $\rightarrow$ تابع ✓

$Df = [b, a]$
 $f(n) = \sqrt{a - bn - n^2}$ $(a \neq 0, b \in \mathbb{Z})$
 $a - b^2 - b^2 = 0 \rightarrow a = 2b^2$
 $a - ab - a^2 = 0 \rightarrow a = ab + a^2 \rightarrow 2b^2 = 2b^2 + 4b^2 \rightarrow 4b^2 = 0 \rightarrow b = 0$
 $a = 0$ $\rightarrow$ تابع ✓

$a + b = 1$
 $b = -1$
 $a = 2$

$y = \frac{r}{\sqrt{ax^2 + bx + c}}$
 $Df = (-\infty, 2) \rightarrow$ یک مشتق منفی!
 $a = 0$
 $\frac{1}{1+1} = \frac{1}{2} \rightarrow b < 0$
 $\alpha = -\frac{c}{b} > 2 \rightarrow c < 2b$
 $c < 2b \rightarrow \frac{c}{b} < 2 \rightarrow \frac{1}{\frac{c}{b}} > \frac{1}{2}$ $\rightarrow$ تابع ✓

$y = \sqrt{\frac{x^2 + 1}{x + b}}$ $y = \sqrt{\frac{x^2 + 1 + a + ab}{x + b}}$ $D_f = (x) + \infty \rightarrow \begin{matrix} x + a = 1 \\ x = -b \rightarrow -b = 1 \rightarrow b = -1 \end{matrix} \rightarrow y = \sqrt{\frac{1}{x - 1}}$ $\frac{1}{x - 1} \geq 0 \rightarrow x > 1$	٢ ٩
الف) $y = \sqrt{\frac{x^3 - x}{x(x-1)(x+1)}}$ $D_f = [-1, 0] \cup [1, +\infty)$ ب) $y = \frac{1}{\sqrt{ x - 1}}$ $x - 1 > 0 \rightarrow x > 1$ $x > 1 \rightarrow D_f = \mathbb{R} - [-1, 1]$ $x < -1 \rightarrow D_f = (-\infty, -1) \cup (1, +\infty)$	٢ ٧
ج) $y = \sqrt{\frac{1}{ x - [x]}}$ $D_f = \mathbb{R} - \{x \mid x = k, k \in \mathbb{Z}\}$ $D_f = \mathbb{R} - \{0, 1, 2, 3, \dots\}$ ب) $\sqrt{x} + \sqrt{y} = 9 \rightarrow \sqrt{y} = 9 - \sqrt{x}$ $x \geq 0 \rightarrow 9 - \sqrt{x} \geq 0 \rightarrow \sqrt{x} \leq 9 \rightarrow x \leq 81 \rightarrow D_f = [0, 81]$	٢ ١
$y = \frac{1}{\sqrt{[x - \frac{1}{x}] + [x + \frac{1}{x}]}}$ $\frac{1}{\sqrt{2[x + \frac{1}{x}]}} \geq 0 \rightarrow [x + \frac{1}{x}] \geq 1 \rightarrow x + \frac{1}{x} \geq 1$ $x > \frac{1}{x} \rightarrow x^2 > 1 \rightarrow x > 1$ $D_f = [\frac{1}{e}, +\infty)$	٢ ٩
$y = \sqrt{1 - 2^{x-a}}$ $D_f = (\frac{a}{2}, \frac{a+1}{2}]$ $c - b = \frac{10 + a - a}{2} = 5$ ب) $1 - 2^{x-a} \geq 0 \rightarrow 1 \geq 2^{x-a} \rightarrow x \leq \frac{10+a}{2}$ ١٠٢ $\rightarrow \frac{a}{2} < x \leq \frac{a+1}{2}$	٢ ١٠