

۱)

الف) $y'' - 2x' = 2x - 1$ $y'' = 2x' + 2x - 1$

(r)

$\left. \begin{matrix} y_1'' = 2x_1' + 2x_1 - 1 \\ y_2'' = 2x_2' + 2x_2 - 1 \end{matrix} \right\} \xrightarrow{\text{تجانس}} y_1'' = y_2'' \rightarrow y_1 = y_2$ تجانس

ب) $x \cos y = y \cos x \xrightarrow{\frac{0}{0}} \frac{1}{x} \cos y = y \cos x \rightarrow \cos y = 0 \rightarrow y = \pi, 2\pi, \dots$ تجانس

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

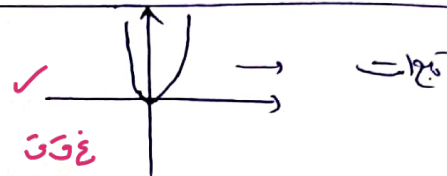
$\rightarrow \sqrt{x} = \sqrt{y} \rightarrow x = y$ تجانس

د) $xy'' + 2x - y' - 2y = 0 \rightarrow x(y'' + 2) - y(y' + 2) = 0 \rightarrow (y' + 2)(x - y) = 0$

$\rightarrow x = y \rightarrow$ تجانس ✓ تجانس $\leftarrow y' + 2 = 0 \rightarrow y' = -2$

۲)

الف) $|y|, x' = ry \begin{cases} y > 0 \rightarrow x' = y \\ y < 0 \rightarrow x' = ry \rightarrow y = \frac{x'}{r} \end{cases}$ تجانس



(r)

ب) $[y] + [x] = 1 \xrightarrow{x=1} [y] = 0 \rightarrow 0 \leq y < 1$ تجانس ✓

۳)

$f(x) = \begin{cases} rx - b & |x-1| \geq 1 \\ a + rx & 0 \leq x \leq 1 \end{cases} \rightarrow \begin{cases} rx - b & x \geq 1 \\ a + rx & 0 \leq x \leq 1 \\ rx - b & x \leq -1 \end{cases} \xrightarrow{x=1} rx - b = a + r$

$a + b = 1 - 4 = -3$ تجانس ✓

۴) $y = \sqrt{a - bx - x^2}$

$\frac{b}{-b} + \frac{a}{b} = \frac{a-b}{b}$

$\begin{cases} a - b^2 - b^2 = 0 \rightarrow 2b^2 = a \\ a - ab - a^2 = 0 \rightarrow 2b^2 - 2b^2 - 4b^2 = 0 \end{cases}$ تجانس ✓

$\rightarrow -2b^2(2b^2 + b - 1) = 0$

$\begin{cases} b = 0 \rightarrow a = 0 \\ b = \frac{1}{2} \rightarrow a = \frac{1}{2} \\ b = -1 \rightarrow a = 1 \end{cases} \rightarrow a + b = 1$ تجانس ✓

۵) $y = \frac{r}{\sqrt{ax^2 + bx + c}}$

$ax^2 + bx + c > 0 \xrightarrow{\Delta} (-\infty, 2)$

$\begin{cases} a = 0 \\ 2b + c = 0 \rightarrow c = -2b \end{cases}$ تجانس ✓

$|a + c - 4b| = 0 \rightarrow -2b + 4b = b$ تجانس ✓

ب (این صورت در این صورت منفی است)

(r)

٤) $y = \sqrt{\frac{13x+1}{x+b} + a}$ $\xrightarrow{\text{دالة}} (x) \rightarrow +\infty$
 $\hookrightarrow \sqrt{\frac{(13+a)x+ab+1}{x+b}}$ $\xrightarrow{\text{مقسوم}} a = -13$ $\xrightarrow{\text{مخرج}} \frac{2}{x+b} \rightarrow b = -2$ ✓

(٢)

٧) $y = \sqrt{x^3 - 1}$ $x^3 - 1 \geq 0 \rightarrow x(x^2 - 1) \geq 0 \rightarrow x(x-1)(x+1) \geq 0$
 $\frac{-1 \ 0 \ 1}{- \ + \ - \ + \ -}$ $\rightarrow$ دالة $[-1, 0] \cup [1, +\infty)$ ✓

(٢)

ب) $y = \frac{1}{\sqrt{x-1}}$ $\rightarrow |x-1| > 0 \rightarrow |x| > 1 \rightarrow x < -1$ $x > 1$ دالة $(-\infty, -1) \cup (1, +\infty)$ ✓

٨) $y = \sqrt{\frac{1}{|x| - [x]}}$ $\rightarrow |x| - [x] \neq 0 \rightarrow |x| \neq [x] \rightarrow$ $\xrightarrow{\text{فقط اعداد صحيحة!}} \begin{matrix} \text{مباينين} \\ \text{يا متساويين} \end{matrix}$ $D_f = \mathbb{R} - \mathbb{Z}$ ✓

(١, ٥)

ب) $\sqrt{x} + \sqrt{y} \leq 9$ $\rightarrow x \geq 0$
 $\hookrightarrow 9 - \sqrt{x} \geq 0 \rightarrow 9 \geq \sqrt{x} \rightarrow 81 \geq x$ دالة $[0, 81]$ ✓

٩) $y = \frac{1}{\sqrt{[x - \frac{1}{x}] + [x + \frac{x}{x}]}}$ $[x - \frac{1}{x}] + [x + \frac{x}{x}] > 0 \xrightarrow{\text{دو طرف}} \underbrace{[x - \frac{1}{x}] + 1}_{[x + \frac{x}{x}]} + [x + \frac{x}{x}] > 1$
 $\rightarrow 2[x + \frac{x}{x}] > 1 \rightarrow [x + \frac{x}{x}] > \frac{1}{2} \rightarrow x + \frac{x}{x} \geq 1 \rightarrow x \geq \frac{1}{x} \rightarrow x \geq \frac{1}{x}$
 دالة $[\frac{1}{x}, +\infty)$ ✓

(٢)

١٥) $y = \sqrt{1 - \log(x-a)}$ $x-a > 0 \rightarrow x > a \rightarrow x > \frac{a}{x}$
 $\hookrightarrow 1 - \log(x-a) \geq 0 \rightarrow 1 \geq \log(x-a) \rightarrow 10 \geq x-a$
 دالة $[\frac{a}{x}, \frac{10+a}{x}] = [b, c]$ $\rightarrow c \leq \frac{10+a}{x}$ $\frac{10+a}{x} \geq x$
 $c-b \leq \frac{10+a}{x} - \frac{a}{x} \leq d$ $\hookrightarrow b = \frac{a}{x}$ ✓

(٢)