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$$x) \frac{y_{n-1}}{n(n-1)} < 0 \Rightarrow (-\infty, 0) \cup \left[\frac{1}{e}, 1\right) \checkmark$$

(9) - 1

$$y) \frac{-n-2}{n(n+1)} \frac{f_{n+1}}{(n-1)(n+1)} \Rightarrow Df \Rightarrow R - \left\{ -2e-1, 0, 1, e, \frac{n}{e} \right\} \checkmark$$

$$x) n = -2e \frac{a}{2} \Rightarrow \frac{-2e \frac{a}{2}}{4-1} \Rightarrow Df \Rightarrow (-\infty, -1] \cup \left[\frac{e}{2}, +\infty\right) \checkmark$$

(12)

$$y) n = 1 \Rightarrow n > 1$$

$$x - \sqrt{x+1} > 0 \Rightarrow x-1 < 1 \Rightarrow x < 2 \Rightarrow [1, 2] \checkmark$$

$$\frac{n^2 - n - 1 > 0 \wedge n^2 - 1 > 0 \wedge \sqrt{n+1} \neq 1}{(-\infty, -1) \cup (1, +\infty)} \checkmark$$

(12) - 5

$$x=2 \Rightarrow -1-2a=0 \Rightarrow a = -\frac{1}{2}$$

$$a=8 = -\frac{1}{2} = -2+b \Rightarrow b = \frac{5}{2} \Rightarrow a+b=1 \checkmark$$

(12) - 5

$$f(n) - n > 0$$

$$f(n) - n = \begin{cases} 2n-2 & n > 1 \\ n+2 & n < 1 \end{cases} \Rightarrow Df = [-2, +\infty) \checkmark$$

(12) - 10

$$1 \leq a + 1 \leq e a - e \Rightarrow a = -1 \checkmark$$

(12) - 4

$$\frac{r-\sqrt{r}}{r+\sqrt{r}} \} \xrightarrow{\text{جس کے لئے}} f(r+\sqrt{r}) + f(r-\sqrt{r}) = r f(r+\sqrt{r})$$

(12) - 1

$$\Rightarrow f(r+\sqrt{r}) = r + \sqrt{r} \xrightarrow{x=r} r + \sqrt{r} \checkmark$$

$$r f(n) - e f(-n) = f(n^r - n) \quad \text{--- (2) - 1}$$

$$r f(-n) - e f(n) = f(n^r + n) \quad \text{--- (2) - 2}$$

$$\Rightarrow -\Delta f(n) = f(n^r - n) - f(n^r + n)$$

$$\Rightarrow f(n) = -f(n^r) - \frac{1}{\Delta} n$$

$$(n+r) f(n) - r n f(n+r) = f(n^r - m n + r m - 1) \quad \text{--- (2) - 3}$$

$$4 f(0) = 9 m - r \Rightarrow 4 m + 1 = 9 m - r \Rightarrow m = \frac{r}{5} \checkmark$$

$$\Rightarrow 4 f(0) = r r, 0 + 1 = r \checkmark \Rightarrow f(0) = \frac{r}{4} \checkmark$$

$$f(-1) + f(-1) = r f(-1) = -1 \Rightarrow f(-1) = -\frac{1}{r} \checkmark \quad \text{--- (2) - 4}$$