

الف) $\sqrt{\frac{x-1}{x}} - \frac{x}{x-1} \rightarrow \sqrt{\frac{x^2-1-x^2}{x(n-1)}} \rightarrow \frac{0}{+0} - \frac{1}{+0} = D_f = (-\infty, 0) \cup [\frac{1}{e}, 1)$

ب) $\frac{x-2x-2}{x(n+1)} = -n-2$
 $\frac{3x+4+x-1}{(x-1)(n+2)} = 5n+2$
 $\frac{-x-2}{x(n+1)} \rightarrow -2$
 $\frac{4x+3}{(x-1)(n+2)} \rightarrow -\frac{5}{2}$

$D_f = \mathbb{R} - \{-2, -\frac{5}{2}, -1, 0, 1\}$

الف) $\sqrt{((\frac{1}{x})^n - 9)(3x - 4x)} \rightarrow \frac{0}{-2}$
 $\frac{-2}{+0} - \frac{0}{+0} = D_f = (-\infty, -2) \cup (\frac{0}{3} + \infty)$

ب) $\sqrt[n]{x-1} + \sqrt{y+1} = 3 \rightarrow x-1 \geq 0 \rightarrow x \geq 1$
 $\sqrt{y+1} = 3 - \sqrt[n]{x-1} \rightarrow 3 - \sqrt[n]{x-1} \geq 0 \rightarrow (3 \geq \sqrt[n]{x-1})^n \rightarrow x \leq 12$
 $D_f = [1, 12]$

$x^2 - x - 2 > 0$
 $\frac{-1}{+0} - \frac{2}{+0} = D_f = (-\infty, -1) \cup (2, +\infty)$
 $(x-2)(x+1)$

$x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1$
 $x \leq -1$

if $x = -2 \rightarrow 3 - 2a - 4 = 0 \rightarrow -1 = 2a \rightarrow a = -\frac{1}{2}$

$3 - \frac{1}{x}n - n^2 = 0 \rightarrow -x^2 - n + 3 = 0 \rightarrow x^2 - x - 3 = 0$
 $(n-5)(n+3)$
 $-2 = \frac{5}{-2} \quad \frac{-3}{-2} = \frac{3}{2}$
 $a + b = -\frac{1}{2} + \frac{3}{2} = 1$
 b

$g(x) = \begin{cases} 2x-2 & x \geq 1 \\ x+3 & x < 1 \end{cases} \rightarrow \begin{cases} 2x-2 \geq 1 \\ x \geq 1 \end{cases} \rightarrow [1, +\infty)$
 $\rightarrow \begin{cases} x+3 \geq 0 \\ x \geq -3 \end{cases} \rightarrow [-3, 1)$

$D_f = [-3, +\infty)$

$f\left(\frac{\sin \frac{\pi}{w} + \cos \pi x}{\sqrt{w+1}}\right)$ $\frac{\sqrt{w+1}}{r}$ $r\left(\frac{\sqrt{w+1}}{r}\right)^r - \frac{r}{r}\left(\frac{\sqrt{w+1}}{r}\right)$ $r\left(\frac{r+r+\sqrt{w}}{r}\right) - r\sqrt{w} - r$ $\frac{r + r\sqrt{w} - r\sqrt{w} - 1}{r} = \frac{-1}{r}$	6
$f\left(\frac{a+1}{a-1}\right) = a \rightarrow \frac{a+1+a-1}{a-1} = a \rightarrow \frac{2a}{r} = a$ $a \in \mathbb{R} - \{1\}$ به ازای جمیع مقادیر a جز 1	7
$g(a) \rightarrow \sqrt{a^r-1} \quad f(\sqrt{a^r-1}) = -r$ $\left(\frac{\sqrt{a^r-1}}{t}\right)^r - r\sqrt{a^r-1} + r = 0$ $t^r - r^r t + r = 0 \rightarrow (t-r)^r = 0 \rightarrow t = r = \sqrt{a^r-1}$ $\sqrt{a^r-1} = r \rightarrow a^r - 1 = r^2 \rightarrow a^r = r^2 + 1$	8
$f(x) \rightarrow 1 - \omega + y \rightarrow \sqrt{r}$ $f(-r) \rightarrow r^2 + r + y \rightarrow \sqrt{r^2}$ $r^2 \times r = \sqrt{r^2}$	9
$t \cos n + \omega \cos n = \frac{r}{1} \omega \rightarrow t \cos n + \omega \cos n - \frac{r}{r} = 0$ $\therefore \tan^2 40 \rightarrow \sqrt{r}$ $\cos n = \frac{1}{r} \rightarrow n = 90^\circ$	10