

الف) $\frac{(x-1)(x-1) - (x)(x)}{(x-1)(x)} \geq 0 \Rightarrow \frac{x^2 - 2x + 1 - x^2}{(x-1)(x)} \geq 0 \Rightarrow \frac{-2x+1}{(x-1)(x)} \geq 0$
 $Df = (-\infty, \frac{1}{2}) \cup (\frac{1}{2}, 1)$

ب) $\frac{x - 2(x+1)}{x(x+1)} = \frac{(-x-2)(x+2)(x-1)}{x(x+1)(x+2)(x-1)} \Rightarrow \frac{-x-2}{x(x+1)} \geq 0$
 $Df = \mathbb{R} - \{-2, -1, -\frac{1}{2}, 0\}$

الف) $(\frac{1}{x})^2 - 4 \geq 0 \Rightarrow \frac{1 - 4x^2}{x^2} \geq 0 \Rightarrow \frac{-4x^2 + 1}{x^2} \geq 0$
 $Df = \mathbb{R} - (-2, \frac{1}{2}) \Rightarrow (-\infty, -2] \cup [\frac{1}{2}, +\infty)$

ب) $x-1 \geq 0 \Rightarrow x \geq 1$
 $\sqrt{y+1} = 3 - \sqrt{x-1} \Rightarrow \sqrt{x-1} \leq 3 \Rightarrow x-1 \leq 9 \Rightarrow x \leq 10$
 $Df = [1, 10]$

الف) $x^2 - 1 \geq 0 \Rightarrow x^2 \geq 1 \Rightarrow x \geq 1 \vee x \leq -1$ I

ب) $x^2 - x - 2 > 0 \Rightarrow (x-2)(x+1) > 0 \Rightarrow \frac{-1}{x-2} > 0 \Rightarrow x > 2 \vee x < -1$ II

$I \cap II \Rightarrow Df = (-\infty, -1) \cup (2, +\infty)$

$-(x^2 - 2x - 3) \geq 0 \Rightarrow x^2 - 2x - 3 < 0 \xrightarrow{x=-1, y=0} x^2 + 2x - 3 = 0$
 $\frac{-2}{1} = \frac{3}{1} \Rightarrow x = -1$
 $x^2 + \frac{1}{x} - 3 < 0$
 $2x^2 + x - 3 < 0$
 $x^2 + x - 4 < 0$
 $(x+1)(x-3) < 0$
 $\frac{-x}{1} = \frac{3}{1} \Rightarrow x = -3$
 $Df = [-3, +\infty)$

$\begin{cases} x \geq 1 & 2x - 2 - x \leq 2x - 2 \geq 0 \Rightarrow x \geq 1 \rightarrow x \geq 1 \text{ I} \\ x < 1 & 2x + 3 - x \leq x + 3 \geq 0 \Rightarrow x \geq -3 \rightarrow -3 \leq x < 1 \text{ II} \end{cases}$

$Df = I \cup II \Rightarrow [-3, +\infty)$

$\sin \frac{\pi}{r} + \cos \frac{\pi}{r}$ $\frac{\sqrt{r}}{r} + 1 = \frac{\sqrt{r+1}}{r}$ $r \left(\frac{\sqrt{r+1}}{r} \right)^r - \frac{r}{r} \left(\frac{\sqrt{r+1}}{r} \right)$ $\hookrightarrow r \left(\frac{r+r+1\sqrt{r}}{r^r} \right) \cdot \frac{r+1\sqrt{r}-1\sqrt{r}-1}{r} = \left[\frac{-1}{r} \right]$	6
$\frac{a+1}{a-1} + 1 = \frac{a+1}{a-1}$ $\frac{a+1}{a-1} - 1 = \frac{a}{a-1}$ $f(f(a)) = a$ $\frac{a+1+a-1}{a-1} = 2$ $\frac{2a}{a-1} = 2$ $2a = 2(a-1)$ $2a = 2a - 2$ $0 = -2$ یہ تمام مقادیر صحیح ہیں؛ مگر اس کے لیے $\in \mathbb{R} - \{1\}$	7
$x^r - rx + r = 0 \quad (x-r)^r = 0 \quad x=r \rightarrow g(x) = r$ $\sqrt{x^r - 1} = r$ $x^r - 1 = r^2$ $x^r = \omega$ $x = \pm \sqrt{\omega} \quad a = \pm \sqrt{\omega}$	8
$x+r = r \quad x=1 \rightarrow f(r) = 1 - \omega + 4 = r$ $x+r = -r \quad x=-4 \rightarrow f(-r) = 34 + 30 + 4 = 68$ $68 \times r = 144$	9
$r \cos^r x + \omega \cos x - \frac{v}{r} = 0$ $\cos^r x + \omega \cos x - 14 = 0$ $(\cos x + v)(\cos x - r)$ $\hookrightarrow \frac{v}{r} = \frac{1}{14} \quad \hookrightarrow \frac{r}{r} = \frac{1}{14}$ $\sin x = \frac{\sqrt{r}}{r}$ $\tan x = \frac{\sqrt{r}}{r}$ $\tan^r x = \frac{r}{r}$	10