

الف) $y = \frac{\sin x - 2}{2 \cos x + 1} \rightarrow 2 \cos x + 1 \neq 0$

$\hookrightarrow \frac{2 \cos x}{2} \neq \frac{-1}{2} \rightarrow \cos x \neq -\frac{1}{2}$

~~$D_f = \mathbb{R} - \{2k\pi + \pi \pm \frac{\pi}{3}\}$~~

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ب) $y = \frac{\sin x + 3}{(\cos x - 1) \neq 0}$

$\rightarrow \cos x \neq 1 \rightarrow D_f = \mathbb{R} - \{2k\pi\}$

الف) $y = \frac{2 \sin x + 1}{\tan x + 1 \neq 0}$

$\rightarrow \tan x \neq -1 \rightarrow \tan x$ باید تعریف شود

$D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}\}$

و $\{k\pi + \frac{\pi}{2}\}$

ب) $y = \frac{\cos x + 1}{\cot x - 1 \neq 0}$

$\rightarrow \cot x \neq 1 \rightarrow \cot x$ باید تعریف شود

$D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}\}, \{k\pi\}$

الف) $\sin y = x^2 - 2$

$\rightarrow -1 \leq x^2 - 2 \leq 1 \rightarrow 1 \leq x^2 \leq 3 \rightarrow \sqrt{1} \leq x \leq \sqrt{3}, -\sqrt{3} \leq x \leq -1$

$D_f = [\sqrt{1}, \sqrt{3}] \cup [-\sqrt{3}, -1]$

ب) $y = \arccos(\sqrt{x} - 3)$

$\rightarrow -1 \leq \sqrt{x} - 3 \leq 1 \rightarrow 2 \leq \sqrt{x} \leq 4 \rightarrow 4 \leq x \leq 16$

$D_f: [\sqrt{2}, 2]$

$D_f: [2, 4]$

الف) $\cos y = |x| - 3$

$\rightarrow -1 \leq |x| - 3 \leq 1 \rightarrow 2 \leq |x| \leq 4 \rightarrow -4 \leq x \leq -2, 2 \leq x \leq 4$

$D_f = [-4, -2] \cup [2, 4]$

ب) $y = \arcsin(x^2 + 3x + 1)$

$\rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \rightarrow 0 \leq (x+1)(x+2) \leq 2$

$D_f: (-\infty, -2], [-3, 0]$

الف) $y = \log_{x-2} x^2 - 4$

$\rightarrow x^2 - 4 > 0 \rightarrow \sqrt{x^2} > \sqrt{4} \rightarrow x > 2, x < -2$

$D_f: (2, +\infty) \cup (-\infty, -2)$

ب) $y = \log_{x-2} x^2 - |x|$

$\rightarrow x^2 - |x| > 0 \rightarrow |x| < 2 \rightarrow -2 < x < 2$

$D_f = (-2, 2)$

الف) $y = \log_{x-r}^{\omega-n} \rightarrow \begin{cases} \omega-n > 0 \rightarrow n < \omega \\ n-r > 0 \rightarrow n > r \\ n-r \neq 1 \rightarrow n \neq r+1 \end{cases}$

$D_f = (r, \omega) - \{r+1\}$

1.8

ب) $y = \log_{u+r}^{u^r-1} \rightarrow \begin{cases} u^r-1 > 0 \rightarrow u^r > 1 \rightarrow u > 1 \vee u < -1 \\ u+r > 0 \rightarrow u > -r \\ u+r \neq 1 \rightarrow u \neq -r \end{cases}$

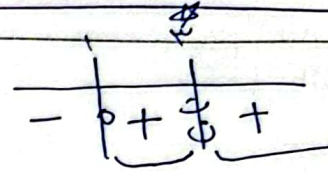
$u > 1 \vee u < -1$

$u > -r \rightarrow D_f = (-r, -1) \cup (1, +\infty) - \{-r\}$

$D_f = (1, +\infty) \cup (-\infty, -1) - \{-r\}$

6

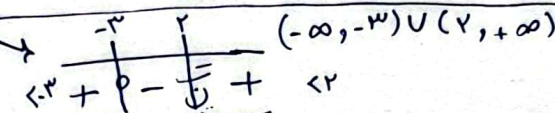
الف) $y = \log \frac{x^r - rx + r}{x-r} > 0 \rightarrow \frac{(x-1)(x-r)}{x-r} > 0$



$\rightarrow D_f: (1, r) \cup (r, +\infty)$

2

ب) $\log \frac{x+r}{x-r} > 0 \rightarrow \frac{x+r}{x-r} > 1 \rightarrow x+r > x-r \rightarrow r > -r \rightarrow r > 0$



$D_f: (-\infty, -r) \cup (r, +\infty) - \{-r\}$

7

الف) $y = \sqrt{r - \log_r(n-r)} \rightarrow n-r > 0 \rightarrow n > r \rightarrow D_f = (r, 10]$

$\rightarrow r - \log_r(n-r) \geq 0 \rightarrow \log_r(n-r) \leq r \rightarrow n-r \leq r^r \rightarrow n \leq 10$

2

ب) $y = \log(r \log_p^n - 1) \rightarrow r \log_p^n - 1 > 0 \rightarrow r \log_p^n > 1 \rightarrow \log_p^n > \frac{1}{r} \rightarrow n > p^{\frac{1}{r}} \rightarrow n > \sqrt{p}$

$D_f: (\sqrt{p}, +\infty)$

1

الف) $y = \frac{r}{x^n+1} \rightarrow x^n \neq -1 \rightarrow x \neq -1 \rightarrow D_f = \mathbb{R} - \{-1\}$

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ب) $y = \frac{r}{x^n-1} \rightarrow x^n \neq 1 \rightarrow x \neq 0 \rightarrow D_f = \mathbb{R} - \{0\}$

9

ج) $y = \frac{r}{x^n-r} \rightarrow x^n \neq r \rightarrow x \neq \sqrt[n]{r} \rightarrow D_f = \mathbb{R} - \{\sqrt[n]{r}\}$

د) $y = \frac{r}{x^n-r} \rightarrow x^n \neq r \rightarrow D_f = \mathbb{R} - \{\log_{\frac{r}{x}}^r\}$

الف) $y = (fn+1)! \rightarrow \begin{cases} fn+1 \in \mathbb{W} \\ fn \in \mathbb{W}-1 \end{cases} \rightarrow n \in \frac{\mathbb{W}-1}{f} \rightarrow D_f = \{n | n = \frac{k-1}{f}, k \in \mathbb{W}\}$

2

ب) $y = \left(\frac{r(n-r)}{rn-\omega}\right)! \rightarrow \frac{r(n-r)}{rn-\omega} \in \mathbb{W} \rightarrow r(n-r) \in rn-\omega \rightarrow D_f = \{n | n = \frac{-\omega+r}{r-\omega}, k \in \mathbb{W}\}$

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$\rightarrow rn - r\omega n \in -\omega n + r \rightarrow n \in \frac{-\omega n + r}{r - r\omega n} \rightarrow D_f = \mathbb{R} - \{\frac{r}{r-\omega}\}$