

1) الف) $y = \frac{\sin x - r}{r \cos x + 1}$

$$r \cos(x) + 1 \neq 0$$

$$r \cos(x) \neq -1$$

$$\cos(x) \neq -\frac{1}{r}$$

$$D_f = \mathbb{R} - \left\{ r k \pi + \frac{\pi}{r}, r k \pi - \frac{\pi}{r} \right\}$$

ب) $y = \frac{\sin x + r}{\cos x - 1}$

$$\cos x - 1 \neq 0$$

$$\cos x \neq 1$$

$$D_f = \mathbb{R} - \{ r k \pi \}$$

الف) $y = \frac{r \sin x + 1}{\tan x + 1}$

$$\tan(x) + 1 \neq 0$$

$$\tan(x) = \frac{\sin(x)}{\cos(x)} \neq -1$$

$$\cos(x) \neq 0$$

$$D_f = \mathbb{R} - \left\{ k \pi + \frac{\pi}{r}, k \pi + \frac{r \pi}{r} \right\}$$

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

$$\cot x - 1 \neq 0 \rightarrow \cot x \neq 1$$

$$\cot(x) = \frac{\cos(x)}{\sin(x)}$$

$$\sin(x) \neq 0$$

$$D_f = \mathbb{R} - \left\{ k \pi, k \pi + \frac{\pi}{r} \right\}$$

2) الف) $\sin y = x^r - r$

$$-1 \leq x^r - r \leq 1$$

$$1 \leq x^r \leq r+1$$

$$x^r \leq r \rightarrow \sqrt[r]{r} \leq x \leq \sqrt[r]{r+1} \quad \text{II}$$

$$1 \leq x^r \rightarrow \left\{ \begin{array}{l} x \geq 1 \\ x \leq -1 \end{array} \right. \quad \text{I}$$

$$\text{I} \cap \text{II} \rightarrow D_f = [-\sqrt[r]{r}, -1] \cup [1, \sqrt[r]{r}]$$

ب) $y = \arccos(\sqrt{x} - r)$

$$-1 \leq \sqrt{x} - r \leq 1$$

$$1 \leq \sqrt{x} \leq r+1 \quad r \leq x \leq (r+1)^2$$

$$D_f = [r, (r+1)^2]$$

الف) $\cos y = |x| - r$

$$-1 \leq |x| - r \leq 1 \rightarrow r \leq |x| \leq r+1$$

$$\left\{ \begin{array}{l} x \leq -r \\ x \geq r \end{array} \right. \quad \text{I} \quad \left\{ \begin{array}{l} -r-1 \leq x \leq -r \\ r \leq x \leq r+1 \end{array} \right. \quad \text{II}$$

$$D_f = [-r-1, -r] \cup [r, r+1]$$

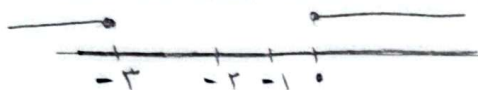
$$f) \text{ ب) } y = \arcsin(x^r + r_{n+1})$$

$$-1 \leq x^r + r_{n+1} \leq 1$$

$$I: -1 \leq x^r + r_{n+1} \rightarrow 0 \leq x^r + r_{n+1} \leq (n+1)(n+r)$$

$$II: x^r + r_{n+1} \leq 1 \rightarrow x^r + r_n \leq 0 \rightarrow n(n+r) \leq 0$$

$$\begin{array}{c} -r \quad -1 \\ + \quad - \quad + \end{array} \quad \begin{array}{c} -r \quad 0 \\ + \quad - \quad + \end{array} \quad D_f = [-r, -r] \cup [-1, 0]$$



$$A) \text{ ا) } \log_r x^r - r$$

$$0 < x^r - r \quad r < x^r \quad \begin{cases} x > r \\ x < -r \end{cases} \quad D_f = (-\infty, -r) \cup (r, +\infty)$$

$$\text{ب) } y = \log_r |r - x|$$

$$0 < |r - x| \quad |x| < r \rightarrow -r < x < r \quad D_f = (-r, r)$$

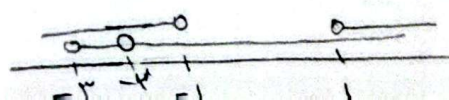
$$4) y = \log_{n-r} \frac{a-n}{n-r}$$

$$\begin{array}{cc} 0 < n-r & 0 < \frac{a-n}{n-r} \\ n-r \neq 1 & r < n & n < a \\ n \neq r & & \end{array} \quad D_f = (r, a) - \{r\}$$

$$\text{ب) } y = \log_{n+r} \frac{x^r - 1}{n+r}$$

$$\begin{array}{cc} n+r \neq 1 & n \neq -r \\ 0 < n+r & -r < n \end{array} \quad D_f = (-r, -1) \cup (1, +\infty) - \{-r\}$$

Parsian



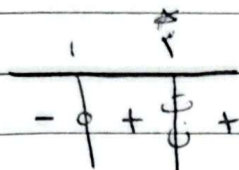
$$\begin{cases} x > 1 \\ x < -1 \end{cases}$$

$$v) y = \log \frac{x^r - rx + r}{n-r}$$

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$$\frac{(x-1)(n-r)}{n-r}$$

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



$$u) y = \log \frac{n+r}{n-r}$$

$$\begin{aligned} 0 < n+r \\ -\Delta < n \\ n+\Delta \neq 1 \\ n \neq -r \\ n \neq r \end{aligned}$$

$$\begin{aligned} 0 < \frac{n+r}{n-r} \\ -r < r \\ + \end{aligned}$$

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



$$a) \text{ الف } y = \sqrt{r - \log_r^{(n-r)}}$$

$$D_f = (r, 1.7]$$

$$0 < r - \log_r^{(n-r)}$$

$$\log_r^{(n-r)} < r$$

$$n-r < 1 \quad n \leq 1$$

$$b) y = \log(r \log_r^n - 1)$$

$$0 < n$$

$$D_f = (\sqrt{r}, +\infty)$$

$$0 < r \log_r^n - 1 \quad 1 < r \log_r^n \quad \frac{1}{r} < \log_r^n$$

$$\log_r^n > \frac{1}{r}$$

$$\sqrt{r} < n$$

$$9) \text{ الف } y = \frac{r}{r^n + 1}$$

$$D_f = \mathbb{R}$$

$$b) y = \frac{r}{r^n - 1}$$

$$D_f = \mathbb{R} - \{0\}$$

$$\begin{aligned} r^n - 1 &\neq 0 \\ r^n &\neq 1 \\ n &\neq 0 \end{aligned}$$

$$ج) y = \frac{r}{r^n - r}$$

$$n \neq \log_r r$$

$$D_f = \mathbb{R} - \{\log_r r\}$$

$$1) \frac{r}{r^n - r}$$

$$D_f = \mathbb{R} - \{\log_r r\}$$

$$10) \text{ الف } y = (f_{n+1})!$$

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$$f_{n+1} \in W$$

$$f_n \in W-1$$

$$x \in \frac{W-1}{f}$$

$$D_f = \{x \mid x = \frac{k-1}{f}, k \in W\}$$

$$\Rightarrow y = \left(\frac{f_{n+1}}{f_{n+1}} \right)!$$

$$\frac{f_{n+1}}{f_{n+1}} \in W$$

$$f_{n+1}W - aW = f_{n+1}$$

$$f_{n+1}W - f_n = aW - f$$

$$x(f_{n+1} - f) = aW - f$$

$$x = \frac{aW - f}{f_{n+1} - f}$$

$$D_f = \{x \mid x = \frac{4K - f}{f_{n+1} - f}, k \in W\}$$