

|                                                                                                                                                                                |                                                                                                                                                                             |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| $الف) y = \frac{\sin x - 2}{2 \cos x + 1}$ $2 \cos x + 1 \neq 0$ $\cos x \neq -\frac{1}{2}$ $D_f = \mathbb{R} - \left\{ 2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3} \right\}$ | $ب) y = \frac{\sin x + 3}{\cos x - 1}$ $\cos x \neq 1$ $D_f = \mathbb{R} - \{ 2k\pi \}$                                                                                     | ۱ |
| $الف) y = \frac{2 \sin x + 1}{\tan x + 1}$ $\tan x \neq -1$ $\tan x = \frac{\sin x}{\cos x}$ $D_f = \mathbb{R} - \left\{ k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right\}$  | $ب) y = \frac{\cos x + 1}{\cot x - 1}$ $\cot x \neq 1$ $\cot x = \frac{\cos x}{\sin x}$ $D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k\pi \right\}$                    | ۲ |
| $الف) \sin y = x^2 - 2$ $-1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3$ $D_f = [-1, -\sqrt{3}] \cup [\sqrt{3}, 1]$                                                      | $ب) y = \arccos(\sqrt{x} - 3)$ $-1 \leq \sqrt{x} - 3 \leq 1$ $0 \leq \sqrt{x} - 2 \leq 2$ $D_f = [4, 16]$                                                                   | ۳ |
| $الف) \cos y =  x  - 3$ $-1 \leq  x  - 3 \leq 1 \Rightarrow 0 \leq  x  - 2 \leq 2$ $\Rightarrow D_f = [-4, -2] \cup [2, 4]$                                                    | $ب) y = \arcsin(x^2 + 2x + 1)$ $-1 \leq (x+2)(x+1) - 1 \leq 1$ $0 \leq (x+2)(x+1) \leq 2$ $D_f = [-3, 0]$ $D_f = \left[ -\frac{3}{2}, -1 \right] \cup \left[ -1, 0 \right]$ | ۴ |
| $الف) y = \log_3(x^2 - 4)$ $x^2 - 4 > 0 \rightarrow x^2 > 4$ $D_f = (-\infty, -2) \cup (2, \infty)$                                                                            | $ب) y = \log_2(x^2 - 1)$ $x^2 - 1 > 0 \rightarrow x^2 > 1$ $D_f = (-\infty, -1) \cup (1, \infty)$                                                                           | ۵ |

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| <p>الف) <math>y = \log_{a-c}^{d-n}</math><br/> <math>\begin{cases} d-n &gt; 0 \\ a &lt; d \end{cases} \mid \begin{cases} a-c &gt; 0 \\ a &gt; c \end{cases}</math></p> <p><math>D_f = (c, d) - \{c\}</math></p>                                                                       | <p>ب) <math>y = \log_{a+c}^{a^2-1}</math><br/> <math>\begin{cases} a^2-1 &gt; 0 \\ a^2 &gt; 1 \end{cases} \mid \begin{cases} a+c &gt; 0 \\ a &gt; -c \end{cases}</math></p> <p><math>D_f = (-\infty, -1) \cup (1, \infty) - \{-2\}</math></p>                        | ٦  |
| <p>الف) <math>y = \log \frac{a^2 - \varepsilon a + c}{a-c}</math><br/> <math>y = \log \frac{(a-\varepsilon)(a-1)}{a-1} = \log^{a-1}</math><br/> <math>a-1 &gt; 0 \rightarrow a &gt; 1</math><br/> <math>D_f = (1, \infty) - \{1\}</math></p>                                          | <p>ب) <math>y = \log \frac{a+c}{a-r}</math><br/> <math>\begin{cases} a+c &gt; 0 \\ a &gt; -c \end{cases} \rightarrow \begin{cases} a &gt; -c \\ a &lt; -r \end{cases}</math></p> <p><math>D_f = (-\infty, -r) \cup (r, \infty) - \{-\varepsilon\}</math></p>         | ٧  |
| <p>الف) <math>y = \sqrt{r - \log_r^{(a-r)}}</math><br/> <math>\begin{cases} a-r &gt; 0 \\ a &gt; r \end{cases} \mid \begin{cases} r - \log_r^{(a-r)} &gt; 0 \\ r &gt; \log_r^{(a-r)} \end{cases}</math><br/> <math>\Rightarrow a \leq 1</math><br/> <math>D_f = (r, 10]</math></p>    | <p>ب) <math>y = \log(r \log_r^a - 1)</math><br/> <math>\begin{cases} r \log_r^a - 1 &gt; 0 \\ \log_r^a &gt; \frac{1}{r} \end{cases}</math><br/> <math>a &gt; r^{\frac{1}{r}} \rightarrow a &gt; \sqrt[r]{r}</math><br/> <math>D_f = (\sqrt[r]{r}, \infty)</math></p> | ٨  |
| <p>الف) <math>y = \frac{r}{\varepsilon^a + 1}</math><br/> <math>\varepsilon^a + 1 \neq 0 \rightarrow \varepsilon^a \neq -1</math><br/> <math>D_f = \mathbb{R}</math></p>                                                                                                              | <p>ب) <math>y = \frac{r}{\varepsilon^a - 1}</math><br/> <math>\varepsilon^a - 1 \neq 0 \rightarrow \varepsilon^a \neq 1</math><br/> <math>D_f = \mathbb{R} - \{0\}</math></p>                                                                                        | ٩  |
| <p>ج) <math>y = \frac{r}{\varepsilon^a - r}</math><br/> <math>\begin{cases} \varepsilon^a - r \neq 0 \\ \varepsilon^a \neq r \end{cases} \mid \begin{cases} a \neq \frac{1}{r} \end{cases}</math><br/> <math>D_f = \mathbb{R} - \{\frac{1}{r}\}</math></p>                            | <p>د) <math>y = \frac{r}{\varepsilon^a - r}</math><br/> <math>\begin{cases} \varepsilon^a - r \neq 0 \\ \varepsilon^a \neq r \end{cases} \mid \begin{cases} a \neq \log_r^r \end{cases}</math><br/> <math>D_f = \mathbb{R} - \{\log_r^r\}</math></p>                 | ١٠ |
| <p>الف) <math>y = (\varepsilon n + 1)! \rightarrow \varepsilon n + 1 \in \mathbb{W}</math><br/> <math>\varepsilon n \in \mathbb{W} - 1 \rightarrow n \in \frac{\mathbb{W}-1}{\varepsilon}</math><br/> <math>D_f = \{n \mid n = \frac{K-1}{\varepsilon}, K \in \mathbb{W}\}</math></p> | <p>ب) <math>y = \left(\frac{r a n - r}{r a - d}\right)! \rightarrow \frac{r a n - r}{r a - d} \in \mathbb{W}</math><br/> <math>n \in \frac{-d \mathbb{W} + r}{r a - r}</math><br/> <math>D_f = \{n \mid n = \frac{dK - r}{rK - r}, K \in \mathbb{W}\}</math></p>     | ١١ |