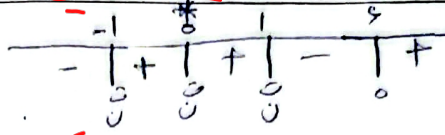
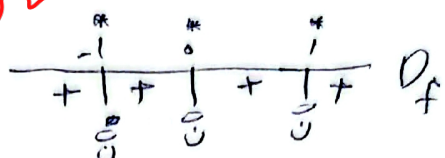


الف) $\sqrt{\frac{x(x-2)}{x(x-1)(x+1)}}$  $D_f = (-1, 0) \cup (0, 1) \cup [1, +\infty)$

ب) $\sqrt{\frac{x^2(x-1)(x+1)}{x(x-1)(x+1)}}$  $D_f = \mathbb{R} - \{-1, 0, 1\}$

الف) $x + |x| > 0 \Rightarrow \begin{matrix} x=0 \times \\ x>0 \checkmark \\ x<0 \times \end{matrix} \Rightarrow D_f = (0, +\infty)$

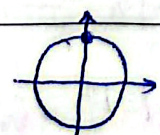
ب) $x|x| > 0 \Rightarrow \begin{matrix} x=0 \times \\ x>0 \checkmark \\ x<0 \times \end{matrix} \Rightarrow D_f = (0, +\infty)$

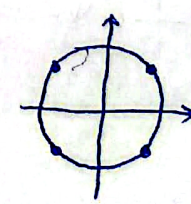
الف) $2 - [x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow D_f = (-\infty, 2)$

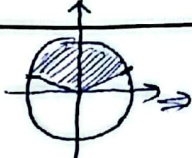
ب) $2 - [x] > 0 \Rightarrow [x] < 2 \Rightarrow D_f = (-\infty, 2)$

الف) $[x + \frac{1}{r} - 1] + [x + \frac{1}{r}] \geq 0 \Rightarrow 2[x + \frac{1}{r}] - 1 \geq 0 \Rightarrow [x + \frac{1}{r}] \geq \frac{1}{2} \Rightarrow x \geq \frac{1}{r} \Rightarrow D_f = [\frac{1}{r}, +\infty)$

ب) $[x - \frac{1}{r}] + [-(x - \frac{1}{r})] \Rightarrow x - \frac{1}{r} \in \mathbb{Z} \Rightarrow D_f = \{x | x = k + \frac{1}{r}, k \in \mathbb{Z}\}$

الف) $\sin x \neq 1 \Rightarrow$  $\Rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب) $2 \sin^2 x \neq 1 \Rightarrow \sin^2 x \neq \frac{1}{2} \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2} \Rightarrow$  $\Rightarrow D_f = \mathbb{R} - \{k\frac{\pi}{2} + \frac{\pi}{4}\}$

$\Rightarrow 2 \sin x - 1 \geq 0 \Rightarrow 2 \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{2} \Rightarrow$

 $\Rightarrow D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$

$\Rightarrow \cos x - 1 \geq 0 \Rightarrow \cos x \geq 1 \Rightarrow D_f = \{2k\pi\}$

$\text{الف) } |x| - 1 \leq |x| - 2 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow \begin{cases} 2 \leq x \leq 4 \\ -4 \leq x \leq -2 \end{cases} \Rightarrow D_f = [2, 4] \cup [-4, -2]$

$\text{ب) } -1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow$

$$\Rightarrow \begin{cases} x^2 + 2x + 1 \leq 1 \Rightarrow x^2 + 2x \leq 0 \Rightarrow x(x+2) \leq 0 \Rightarrow \frac{-2}{+} \frac{0}{-} \frac{+}{+} \\ x^2 + 2x + 1 \geq -1 \Rightarrow x^2 + 2x + 2 \geq 0 \Rightarrow (x+1)^2 \geq 0 \Rightarrow \frac{-1}{+} \frac{-1}{-} \frac{+}{+} \end{cases} \Rightarrow D_f = [-2, -1] \cup [-1, 0]$$

$\text{الف) } x - 2 > 0 \Rightarrow x > 2$
 $x - \log_r^{x-2} \geq 0 \Rightarrow \log_r^{x-2} \leq x \Rightarrow x - 2 \leq 1 \Rightarrow x \leq 3 \Rightarrow D_f = (2, 3]$

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

$\text{الف) } f^x + 1 \neq 0 \Rightarrow f^x \neq -1 \Rightarrow D_f = \mathbb{R}$

$\text{ب) } f^x - 1 \neq 0 \Rightarrow f^x \neq 1 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$

$\text{ج) } f^x \neq 2 \Rightarrow x \neq \log_r^2 \Rightarrow D_f = \mathbb{R} - \{\log_r^2\}$

$\text{د) } f^x \neq 3 \Rightarrow x \neq \log_r^3 \Rightarrow D_f = \mathbb{R} - \{\log_r^3\}$

$\text{الف) } f^{n+1} \in \mathbb{W} \Rightarrow f^n \in \mathbb{W} - 1 \Rightarrow n \in \frac{\mathbb{W}-1}{f} \Rightarrow D_f = \{n | n = \frac{k-1}{f}, k \in \mathbb{W}\}$

$\text{ب) } \frac{f^n - 2}{f^n - 1} \in \mathbb{W} \Rightarrow n = -\frac{-2\mathbb{W} + 1}{f\mathbb{W} - 1} = \frac{2\mathbb{W} - 1}{f\mathbb{W} - 1} \Rightarrow D_f = \{n | n = \frac{2k-1}{fk-1}, k \in \mathbb{W}\}$