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الف)  $y = \sqrt{\frac{x^2 - 4x}{x^2 - x}} \rightarrow \sqrt{\frac{x(x-4)}{x(x^2-1)}} \rightarrow \frac{-1 \quad 0 \quad 1 \quad 4}{-1 \quad 0 \quad 1 \quad 4} \quad (-1 \ 0) \cup (0 \ 1) \cup (4 \ +\infty)$

ب)  $y = \sqrt{\frac{x^3 - x^2}{x^2 - x}} \rightarrow \sqrt{\frac{x^2(x-1)}{x(x^2-1)}} \rightarrow \frac{-1 \quad 0 \quad 1}{+1 \quad +1 \quad +1} \quad (-\infty -1) \cup (-1 \ 0) \cup (0 \ 1) \cup (1 \ +\infty)$

الف)  $y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \rightarrow D_f = \mathbb{R}^+$

⊕ ✓  
⊗ ×  
⊖ ×

ب)  $y = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow D_f = \mathbb{R}^+$

⊕ ✓ ⊗ ×  
⊖ ×

الف)  $y = \sqrt{2 - [x]} \rightarrow 2 - [x] \geq 0 \rightarrow 2 \geq [x] \rightarrow D_f = (-\infty \ 2]$

ب)  $y = \frac{1}{\sqrt{2 - [x]}} \rightarrow 2 - [x] > 0 \rightarrow 2 > [x] \rightarrow D_f = (-\infty \ 2)$

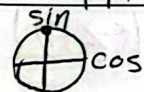
الف)  $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right]} \rightarrow \sqrt{\left[x + \frac{1}{x} - 1\right] + \left[x + \frac{1}{x}\right]} \rightarrow \sqrt{\left[x + \frac{1}{x}\right] - 1} \rightarrow \left[x + \frac{1}{x}\right] - 1 \geq 0$

⊕ ✓  $\rightarrow \left[x + \frac{1}{x}\right] \geq 1 \rightarrow \left[x + \frac{1}{x}\right] \geq \frac{1}{x} \rightarrow D_f = \left[\frac{1}{x} \ +\infty\right)$

ب)  $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[-x + \frac{1}{x}\right]} \rightarrow \sqrt{\left[x - \frac{1}{x}\right] + \left[-\left(x - \frac{1}{x}\right)\right]} \rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$

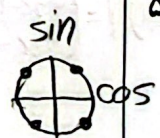
⊕  $[T] + [-T] = \dots$   $D_f = \left\{x = k + \frac{1}{x} \mid k \in \mathbb{Z}\right\}$

الف)  $y = \frac{x}{\sin x - 1} \rightarrow \sin x - 1 \neq 0 \rightarrow \sin x \neq 1 \rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{2}\right\}$

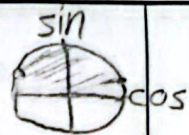


ب)  $y = \frac{x}{x \sin x - 1} \rightarrow x \sin^2 x - 1 \neq 0 \rightarrow x \sin^2 x \neq 1 \rightarrow \sin^2 x \neq \frac{1}{x} \rightarrow$

$D_f = \mathbb{R} - \left\{k\pi \pm \frac{\pi}{2}\right\}$



الف)  $y = \sqrt{2\sin x - 1} \rightarrow 2\sin x - 1 \geq 0 \rightarrow 2\sin x \geq 1 \rightarrow$



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

(2) ✓

ب)  $y = \sqrt{\cos x - 1} \rightarrow \cos x - 1 \geq 0 \rightarrow \cos x \geq 1 \rightarrow D_f = \{k\pi\}$

الف)  $\cos y = |x| - 3 \rightarrow -1 \leq |x| - 3 \leq 1 \rightarrow D_f = [-2, 4] \cup [2, 4]$

1.75

ب)  $y = \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \quad A \cap B = [-3, -2] \cup [-1, 0]$

أ)  $0 \leq x^2 + 3x + 1 \rightarrow 0 \leq (x+1)(x+1) \rightarrow \frac{-1}{+} \frac{-1}{-} \frac{+}{+} \quad \text{③} \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow \frac{-3}{+} \frac{0}{-} \frac{+}{+}$

الف)  $y = \sqrt{2 - \log_2(x-2)} \rightarrow x-2 \geq 0 \rightarrow x \geq 2 \rightarrow D_f = [2, \infty)$

(2) ✓

$x-2 \leq 9 \rightarrow x \leq 11$

ب)  $y = \log(x^2 - x) \rightarrow x^2 - x \geq 0 \rightarrow x(x-1) \geq 0 \rightarrow \frac{-1}{-} \frac{0}{+} \frac{1}{+}$

$D_f = (-1, 0) \cup (1, +\infty)$

الف)  $y = \frac{3}{f^x + 1} \rightarrow f^x + 1 \neq 0 \rightarrow f^x \neq -1 \rightarrow x \in \mathbb{R} \rightarrow D_f = \mathbb{R}$

ب)  $y = \frac{3}{f^x - 1} \rightarrow f^x - 1 \neq 0 \rightarrow f^x \neq 1 \rightarrow x \neq 0 \rightarrow D_f = \mathbb{R} - \{0\}$

ج)  $y = \frac{3}{f^x - 2} \rightarrow f^x - 2 \neq 0 \rightarrow f^x \neq 2 \rightarrow x \neq \log_f 2 \rightarrow D_f = \mathbb{R} - \{\log_f 2\}$

د)  $y = \frac{3}{f^x - 3} \rightarrow f^x - 3 \neq 0 \rightarrow f^x \neq 3 \rightarrow x \neq \log_f 3 \rightarrow D_f = \mathbb{R} - \{\log_f 3\}$

الف)  $y = (f^x + 1)!$   $f^x + 1 \in \mathbb{W} \rightarrow f^x \in \mathbb{W} - 1 \rightarrow x \in \frac{\mathbb{W} - 1}{f} \rightarrow D_f = \left\{ x = \frac{k-1}{f} \mid k \in \mathbb{W} \right\}$

ب)  $y = \left( \frac{3x-2}{2x-\omega} \right)!$   $\frac{3x-2}{2x-\omega} \in \mathbb{W} \rightarrow 3x-2 = 2x-\omega \rightarrow 3x-2x = 2-\omega$

$\rightarrow x = \frac{2-\omega}{3-2\omega} \rightarrow D_f = \left\{ x \mid x = \frac{\omega k - 2}{2k - 3}, k \in \mathbb{W} \right\}$