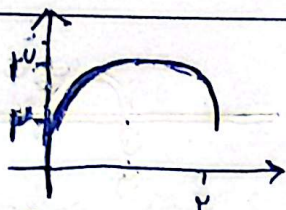


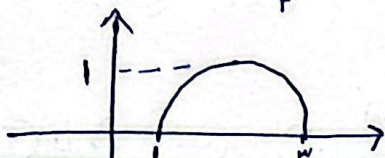
الف) $f(x) + 2$



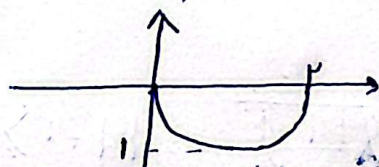
ب) $2f(x)$



ج) $f(x-1)$



د) $-f(x)$



الف) $x^2 - 5x + 4 > 0 \rightarrow (x-1)(x-4) > 0$ $\frac{+}{-} \frac{+}{-} \frac{+}{+} \rightarrow (-\infty, 1) \cup (4, +\infty)$

ب) $x^2 - 9x + 4 < 0 \rightarrow (x-1)(x-4) < 0$ $\frac{+}{+} \frac{-}{-} \frac{+}{+} \rightarrow (1, 4)$

ج) $x^2 + 9x + 4 \geq 0 \rightarrow (x+1)(x+4) \geq 0$ $\frac{-}{+} \frac{-}{+} \frac{+}{+} \rightarrow (-\infty, -4] \cup [-1, +\infty)$

د) $x^2 - 7x + 4 \leq 0 \rightarrow (x-1)(x-4) \leq 0$ $\frac{+}{+} \frac{-}{-} \frac{+}{+} \rightarrow [1, 4]$

الف) $\frac{x^2 - 3x + 2}{x - 5} < 0 \rightarrow \frac{(x-1)(x-2)}{x-5} < 0$ $\frac{-}{-} \frac{+}{+} \frac{+}{-} \frac{+}{+} \rightarrow$

$\Rightarrow (-\infty, 1] \cup [2, 5)$

ب) $\frac{x^2 - 1}{x^2 - 9x + 4} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-1)(x-4)} \geq 0$ $\frac{-}{+} \frac{+}{-} \frac{+}{-} \frac{+}{+} \rightarrow$
 $(-\infty, -1] \cup (4, +\infty)$

الف) $y = \sqrt{\frac{x^2 - 1}{x^2 - x}}$ $\textcircled{1}$ $\frac{-}{+} \frac{+}{-} \frac{+}{+} \frac{+}{+} \rightarrow$
 $\textcircled{0}, \textcircled{1}, \textcircled{-1}$ $\textcircled{0}, \textcircled{1}, \textcircled{-1}$

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

ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} = \sqrt{\frac{(x-4)(x+4)}{(x-1)(x-4)}}$ $\frac{-}{+} \frac{+}{-} \frac{+}{+} \frac{+}{+} \rightarrow$

$D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

الف) $y = \sqrt{4 - \sqrt{2-x}}$ $\Rightarrow \begin{cases} 2-x \geq 0 \rightarrow x \leq 2 \\ 4 - \sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow -14 \leq x \end{cases}$ $D_f = [-14, 2]$

ب) $y = \sqrt{3|x| - 9}$ $\Rightarrow 3|x| - 9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3$

$D_f = (-\infty, -3] \cup [3, +\infty)$

مربوط به سوال ۴

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

$$D_f = [-1, +1]$$

$$\text{ب) } y = \sqrt{3-\sqrt{x-1}} \rightarrow x-1 \geq 0 \rightarrow x \geq 1$$

$$3-\sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq 3 \rightarrow x \leq 11 \Rightarrow D_f = [1, 11]$$

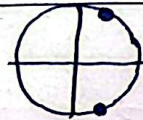
مربوط به سوال 5

$$\text{الف) } \sqrt[3]{\frac{|x|+1}{|x|-3}} \rightarrow |x|+1 \geq 0 \rightarrow |x| \geq -1 \quad |x|-3 \geq 0 \rightarrow |x| \geq 3 \rightarrow D_f = (-\infty, -3) \cup (3, +\infty) \subset \mathbb{R} - \{\pm 3\}$$

$$\text{ب) } \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \rightarrow \sqrt{x}+1 \geq 0 \rightarrow \sqrt{x} \geq -1 \rightarrow x \geq 1$$

$$\sqrt{x}-3 \geq 0 \rightarrow \sqrt{x} \geq 3 \rightarrow x \geq 9 \Rightarrow D_f = (9, +\infty)$$

$$\text{الف) } \frac{\sin x}{\cos x - 1} \Rightarrow \cos x - 1 \neq 0 \rightarrow \cos x \neq 1$$



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

$$\text{ب) } \frac{\cos x + 1}{\sin x + 1} \Rightarrow \sin x + 1 \neq 0 \rightarrow \sin x \neq -1$$



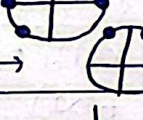
$$D_f = \mathbb{R} - \{2k\pi - \frac{\pi}{2}, 2k\pi + \frac{\pi}{2}\}$$

$$\text{ج) } y = \frac{\tan x + 1}{\cot x - 1} \Rightarrow \frac{\cos x}{\sin x} x - 1 \rightarrow \frac{\cos x}{\sin x} \neq 1$$



$$D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}\}$$

$$\text{د) } y = \frac{\sin x + 1}{\sin^2 x - 3} \Rightarrow \sin^2 x - 3 \neq 0 \rightarrow \sin x \neq \pm \sqrt{3}$$



$$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}, 2k\pi - \frac{\pi}{2}\}$$

$$y = \frac{1}{\sqrt{2|x-2| - \frac{1}{2}}} \rightarrow 2|x-2| - \frac{1}{2} > 0 \rightarrow |x-2| > \frac{1}{4} \rightarrow$$

$$\begin{cases} x-2 > \frac{1}{4} \rightarrow x > \frac{9}{4} \\ x-2 < -\frac{1}{4} \rightarrow x < \frac{7}{4} \end{cases} \Rightarrow D_f = (-\infty, \frac{7}{4}) \cup (\frac{9}{4}, +\infty)$$

$$\text{الف) } y = \sqrt{4-2|x|} \rightarrow 4-2|x| \geq 0 \rightarrow 2|x| \leq 4 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2 \rightarrow D_f = [-2, 2]$$

$$\text{ب) } y = \sqrt{\frac{|x|}{|x|}} \rightarrow \begin{cases} |x| \neq 0 \rightarrow x \neq 0 \\ |x| \geq 0 \rightarrow x \geq 0 \end{cases} \Rightarrow D_f = \mathbb{R} - \{0\}$$