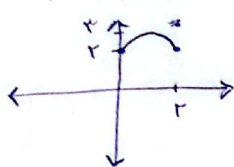
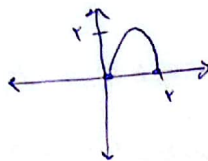


19, 28

الف) $f(x) + 2$

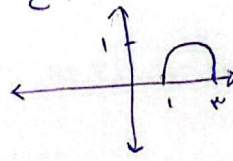


ب) $2 \neq f(x)$

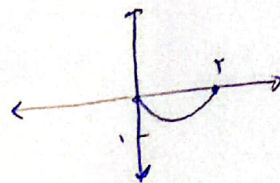


(2) ✓

ج) $f(x-1)$



د) $-f(x)$



الف) $x^2 - 5x + 4 > 0$
 $(x-4)(x-1) > 0$
 (3) (5)

$\frac{2}{+} \frac{4}{-} \frac{+}{+}$
 $(-\infty, 1) \cup (4, +\infty)$

ب) $x^2 + 4x + 5 > 0$
 $(x+1)(x+5) > 0$
 (-1) (-5)

$\frac{-5}{+} \frac{-1}{-} \frac{+}{+}$
 $(-\infty, -5] \cup [-1, +\infty)$

ب) $x^2 - 4x + 5 < 0$
 $(x-1)(x-5) < 0$
 (1) (5)

$\frac{1}{+} \frac{5}{-} \frac{+}{+}$
 $(1, 5)$ (2) ✓

د) $x^2 - 7x + 4 \leq 0$
 $(x-1)(x-4) \leq 0$
 (1) (4)

$\frac{1}{+} \frac{4}{-} \frac{+}{+}$
 $[1, 4]$

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

$\frac{1}{-} \frac{2}{+} \frac{5}{-} \frac{+}{+}$
 $(-\infty, 1) \cup (2, 5)$

ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \Rightarrow \frac{(x+1)(x-1)}{(x-5)(x-1)}$
 (-1) (1) (5) (1)

$\frac{-1}{+} \frac{1}{-} \frac{5}{-} \frac{+}{+}$
 $(-\infty, -1] \cup (5, +\infty)$

(2) ✓

الف) $y \leq \sqrt{\frac{x^2 - 1}{x^2 - x}} \Rightarrow \frac{x^2 - 1}{x^2 - x} \geq 0 \Rightarrow \frac{x^2 - 1}{x(x+1)(x-1)}$
 (1) (0) (-1) (1)

$\frac{-1}{+} \frac{0}{-} \frac{1}{+} \frac{+}{+}$
 $(-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

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

(2) ✓

ب) $y \leq \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} \Rightarrow \frac{x^2 - 14}{x^2 - 5x + 4} \geq 0 \Rightarrow \frac{(x+4)(x-4)}{(x-4)(x-1)}$
 (-4) (4) (1) (4)

$\frac{-4}{+} \frac{4}{-} \frac{1}{+} \frac{+}{+}$
 $(-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

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

الف) $y \leq \sqrt{4 - \sqrt{2 - x}}$
 $\begin{cases} 2 - x \geq 0 \Rightarrow x \leq 2 \\ 4 - \sqrt{2 - x} \geq 0 \Rightarrow 4 \geq \sqrt{2 - x} \Rightarrow 16 \geq 2 - x \Rightarrow x \geq -14 \end{cases}$

$D_f = [-14, 2]$

ب) $y \leq \sqrt{3 - \sqrt{x - 2}}$
 $\begin{cases} x - 2 \geq 0 \Rightarrow x \geq 2 \\ 3 - \sqrt{x - 2} \geq 0 \Rightarrow 3 \geq \sqrt{x - 2} \Rightarrow 9 \geq x - 2 \Rightarrow x \leq 11 \end{cases}$

$D_f = [2, 11]$

$$\text{الف) } y = \sqrt{\varepsilon - 2x^2} \Rightarrow \varepsilon - 2x^2 \geq 0 \Rightarrow \varepsilon \geq 2x^2 \Rightarrow x^2 \leq \frac{\varepsilon}{2} \Rightarrow -\sqrt{\frac{\varepsilon}{2}} \leq x \leq \sqrt{\frac{\varepsilon}{2}}$$

$$D_f = [-\sqrt{\frac{\varepsilon}{2}}, \sqrt{\frac{\varepsilon}{2}}]$$

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

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

$$\text{الف) } y = \sqrt{\frac{|x|+1}{|x|-3}} \Rightarrow |x|-3 \neq 0 \Rightarrow |x| \neq 3 \quad D_f = \mathbb{R} - \{\pm 3\}$$

$$\text{ب) } y = \sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \Rightarrow \sqrt{x}-3 \neq 0 \Rightarrow \sqrt{x} \neq 3 \Rightarrow x \neq 9$$

راديكال باياد تعريف شود

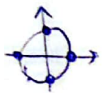
$$D_f = \mathbb{R} - \{9\}$$

$$\text{الف) } y = \frac{\sin x}{2\cos x - 1} \Rightarrow 2\cos x - 1 \neq 0 \Rightarrow 2\cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{2}$$

$$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$$

$$\text{ب) } y = \frac{\cos x + 1}{2\sin x + 1} \Rightarrow 2\sin x + 1 \neq 0 \Rightarrow 2\sin x \neq -1 \Rightarrow \sin x \neq -\frac{1}{2}$$

$$D_f = \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\}$$



$$\text{ج) } y = \frac{\tan x + 2}{\cot x - 1} \Rightarrow \cot x - 1 \neq 0 \Rightarrow \cot x \neq 1 \Rightarrow \frac{\cos x}{\sin x} \neq 1$$

$$D_f = \mathbb{R} - \{k\pi, 2k\pi \pm \frac{\pi}{4}\}$$

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

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

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

$$\begin{cases} x-2 > \frac{1}{4} \Rightarrow x > 2\frac{1}{4} \\ x-2 < -\frac{1}{4} \Rightarrow x < 2\frac{3}{4} \end{cases}$$

$$D_f = (-\infty, 2\frac{1}{4}) \cup (2\frac{3}{4}, +\infty)$$

$$\text{الف) } y = \sqrt{\varepsilon - 2|x|} \Rightarrow \varepsilon - 2|x| \geq 0 \Rightarrow \varepsilon \geq 2|x| \Rightarrow |x| \leq \frac{\varepsilon}{2} \Rightarrow -\frac{\varepsilon}{2} \leq x \leq \frac{\varepsilon}{2}$$

$$D_f = [-\frac{\varepsilon}{2}, \frac{\varepsilon}{2}]$$

$$\text{ب) } y = \sqrt{\frac{|x|}{|x|}} \quad D_f = \mathbb{R} - \{0\}$$