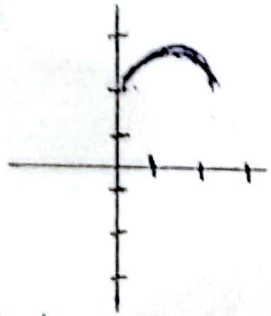
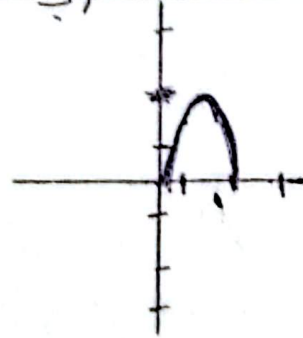


الف)

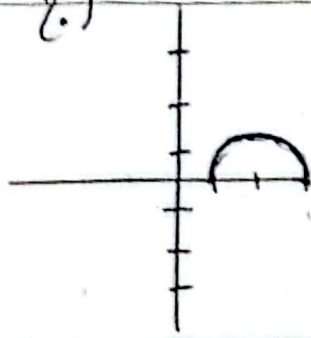


$f(x) = x^2 - x + 2$

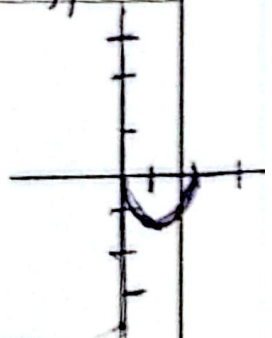
ب)



ج)



د)



الف)  $x^2 - 5x + 4 > 0 \Rightarrow (x-1)(x-4) > 0 \Rightarrow x < 1 \text{ or } x > 4 \Rightarrow (-\infty, 1) \cup (4, \infty)$

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

ج)  $x^2 + 4x + 5 > 0 \Rightarrow (x+5)(x+1) > 0 \Rightarrow x < -5 \text{ or } x > -1 \Rightarrow (-\infty, -5) \cup (-1, \infty)$

د)  $x^2 - 7x + 4 < 0 \Rightarrow (x-4)(x-1) < 0 \Rightarrow 1 < x < 4 \Rightarrow (1, 4)$

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

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

الف)  $\sqrt{\frac{x^2 - 1}{x^2 - x}} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{x(x-1)} \geq 0 \Rightarrow \frac{x+1}{x} \geq 0 \Rightarrow (-\infty, -1] \cup (0, \infty)$

ب)  $\sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} \geq 0 \Rightarrow \frac{(x+4)(x-4)}{(x-1)(x-4)} \geq 0 \Rightarrow \frac{x+4}{x-1} \geq 0 \Rightarrow (-\infty, -4] \cup (1, \infty)$

الف)  $\sqrt{x+2} - x \geq 0 \Rightarrow x \leq 2 \text{ and } x \geq -2 \Rightarrow x \in [-2, 2]$

ب)  $\sqrt{3 - \sqrt{x-2}} \geq 0 \Rightarrow x \geq 2 \text{ and } 3 - \sqrt{x-2} \geq 0 \Rightarrow \sqrt{x-2} \leq 3 \Rightarrow x-2 \leq 9 \Rightarrow x \leq 11 \Rightarrow [2, 11]$

الف)  $\sqrt{x-2} \Rightarrow x-2 \geq 0 \quad x \leq 2 \quad -\sqrt{2} \leq x \leq \sqrt{2}$   
 $[-\sqrt{2}, \sqrt{2}]$

ب)  $\sqrt{3|x|-9} \quad 3|x|-9 \geq 0 \quad 3|x| \geq 9 \quad |x| \geq 3 \quad x \geq 3 \text{ or } x \leq -3$

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

الف)  $\sqrt{\frac{|x|+1}{|x|-3}}$   $|x| \geq 0$   $|x|-3 \neq 0$   $|x| \neq 3$   $D = \mathbb{R} - \{-3, 3\}$

ب)  $\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}}$   $x \geq 0$   $\sqrt{x}-3 \neq 0$   $\sqrt{x} \neq 3$   $x \neq 9$   $D = [0, 9) \cup (9, +\infty)$

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

ب)  $\frac{\cos x + 1}{\sin x + 1} \Rightarrow \sin x \neq -1 \Rightarrow x \neq -\frac{\pi}{2} + 2k\pi$   $D = \mathbb{R} - \{-\frac{\pi}{2} + 2k\pi\}$

ج)  $\frac{\tan x + 1}{\cot x - 1} \Rightarrow \frac{\sin x}{\cos x} + 1 \neq \frac{\cos x}{\sin x} - 1 \Rightarrow \sin x \neq 0 \Rightarrow x \neq k\pi$   $\cot x \neq 1 \Rightarrow \tan x \neq 1 \Rightarrow x \neq \frac{\pi}{4} + k\pi$   $D = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$

د)  $\frac{\sin x + 1}{\sin^2 x - 3} \Rightarrow \sin^2 x \neq 3 \Rightarrow \sin x \neq \pm \sqrt{3}$   $D = \mathbb{R}$

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

$D = (-\infty, \frac{2}{x-1}) \cup (\frac{2}{x-1}, +\infty)$

الف)  $\sqrt{x-2|x|} \Rightarrow x-2|x| \geq 0 \quad |x| \leq 2 \quad -2 \leq x \leq 2$   $D = [-2, 2]$

ب)  $\sqrt{\frac{|x|}{|x|}}$   $|x| \neq 0$   $\frac{|x|}{|x|} = 1$   $D = \mathbb{R} - \{0\}$