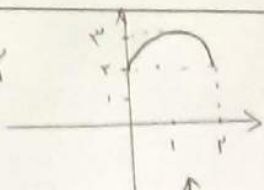


۲. آنین

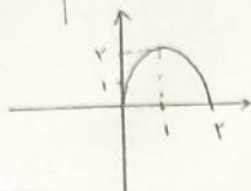
الف) $f(x) + 2$



ج) $f(x-1)$

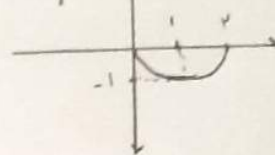


ب) $2f(x)$



د) $-f(x)$

د) $-f(x)$



الف) $x^2 - 5x + 6 > 0 \Rightarrow (x-2)(x-3) > 0$ $\frac{+}{-} \frac{-}{+} \frac{+}{+} \Rightarrow D_f = (-\infty, 2) \cup (3, +\infty)$

ب) $x^2 - 4x + 5 < 0 \Rightarrow (x-1)(x-5) < 0$ $\frac{+}{+} \frac{-}{-} \frac{+}{+} \Rightarrow D_f = (1, 5)$

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

د) $x^2 - 7x + 6 \leq 0 \Rightarrow (x-1)(x-6) \leq 0$ $\frac{+}{+} \frac{-}{-} \frac{+}{+} \Rightarrow D_f = [1, 6]$ د) ✓

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

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

الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}}$

$0 \leq \frac{x^3 - 1}{x^3 - x} = \frac{x^3 - 1}{x(x-1)(x+1)}$

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

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

$\frac{(x+4)(x-4)}{(x-1)(x-4)}$

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

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

الف) $y = \sqrt{4 - \sqrt{2-x}}$

① $2-x \geq 0 \Rightarrow x \leq 2$

② $4 - \sqrt{2-x} \geq 0 \Rightarrow 4 \geq \sqrt{2-x} \Rightarrow -14 \leq x$

$\Rightarrow D_f = -14 \leq x \leq 2 \in [-14, 2]$ د) ✓

ب) $y = \sqrt{2 - \sqrt{x-2}}$

① $x-2 \geq 0 \Rightarrow x \geq 2$

② $2 - \sqrt{x-2} \geq 0 \Rightarrow 2 \geq \sqrt{x-2} \Rightarrow 11 \geq x$

$\Rightarrow D_f = 2 \leq x \leq 11 \in [2, 11]$

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

ب) $y = \sqrt{3|x|-9}$
 $3|x|-9 \geq 0$
 $3(|x|-3) \geq 0$
 $|x|-3 \geq 0$
 $|x| \geq 3 \Rightarrow x \in \mathbb{R} - (-3, 3)$
 $D_f = (-\infty, -3] \cup [3, +\infty)$

الف) $y = \sqrt{\frac{|x|+1}{|x|-2}}$
 $|x|-2 \neq 0$
 $|x| \neq 2 \Rightarrow x \neq \pm 2$
 $\Rightarrow D_f = \mathbb{R} - \{\pm 2\}$

ب) $y = \sqrt{\frac{\sqrt{x+1}}{\sqrt{x-2}}}$
 $x \geq 0$
 $\sqrt{x-2} \neq 0$
 $\sqrt{x} \neq 2$
 $x \neq 4$
 $\Rightarrow D_f = [0, +\infty) - \{4\}$

الف) $y = \frac{\sin x}{x \cos x - 1}$
 $x \cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{x} \Rightarrow D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{2}\}$

ب) $y = \frac{\cos x + 1}{x \sin x + 1}$
 $x \sin x + 1 \neq 0 \Rightarrow \sin x \neq -\frac{1}{x} \Rightarrow D_f = \mathbb{R} - \{2k\pi - \frac{5\pi}{4}, 2k\pi - \frac{\pi}{4}\}$

ج) $y = \frac{\tan x + 1}{\cot x - 1}$
 $\sin \neq 0, \cot x - 1 \neq 0 \Rightarrow \frac{\cos}{\sin} \neq 1 \Rightarrow D_f = \mathbb{R} - \{\frac{k\pi}{2}, 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}\}$

د) $y = \frac{\sin x + 1}{x \sin x - 2}$
 $x \sin x - 2 \neq 0 \Rightarrow \sin x \neq \frac{2}{x}$
 $\sin x \neq \frac{2}{x} \Rightarrow \sin x \neq \frac{\sqrt{2}}{\frac{x}{\sqrt{2}}}$
 $\Rightarrow D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{4}\}$

$y = \frac{1}{\sqrt{|x-2|-\frac{1}{4}}}$
 $|x-2|-\frac{1}{4} > 0 \Rightarrow |x-2| > \frac{1}{4} \Rightarrow |x-2| > \frac{1}{4}$
 $\Rightarrow D_f = (-\infty, \frac{9}{4}) \cup (\frac{9}{4}, +\infty)$

① $-x+2 > \frac{1}{4} \Rightarrow x < \frac{7}{4}$
 ② $x-2 > \frac{1}{4} \Rightarrow x > \frac{9}{4}$

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

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