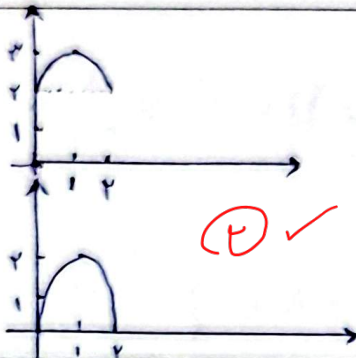


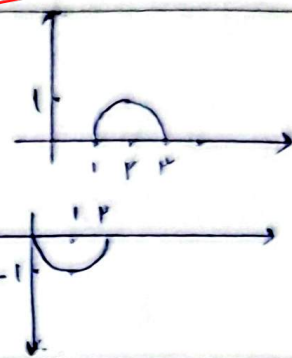
الف) $f(x) + 2$



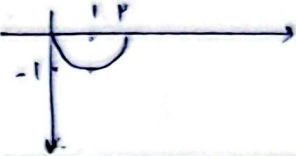
ب) $2f(x)$

✓

ج) $f(x-1)$



د) $-f(x)$



الف) $x^2 - 5x + 4 > 0 \Rightarrow (x-4)(x-1) > 0$
 جواب: $(-\infty, 1) \cup (4, \infty)$

x	$-\infty$	1	4	$+\infty$
$f(x)$	+	-	+	+

ب) $x^2 - 2x + 1 < 0 \Rightarrow (x-1)(x-1) < 0$
 جواب: $(1, 1)$

x	$-\infty$	1	1	$+\infty$
$f(x)$	+	-	+	+

ج) $x^2 + 4x + 5 > 0 \Rightarrow (x+1)(x+5) > 0$
 جواب: $(-\infty, -5) \cup (-1, +\infty)$

x	$-\infty$	-5	-1	$+\infty$
$f(x)$	+	-	+	+

د) $x^2 - 4x + 4 \leq 0 \Rightarrow (x-1)(x-4) \leq 0$
 جواب: $[1, 4]$

x	$-\infty$	1	4	$+\infty$
$f(x)$	+	-	+	+

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

x	$-\infty$	1	2	5	$+\infty$
$f(x)$	-	+	-	+	+

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

x	$-\infty$	-1	1	5	$+\infty$
$f(x)$	+	-	+	-	+

الف) $y = \sqrt{\frac{x^2 - 1}{x^2 - x}} = \sqrt{\frac{(x-1)(x+1)}{x(x-1)(x+1)}} = \sqrt{\frac{1}{x}}$
 $Df = \mathbb{R} - [-1, 0] - \{1\} = \mathbb{R} - ([-1, 0] \cup \{1\})$

x	$-\infty$	-1	0	1	$+\infty$
$f(x)$	+	-	+	+	+

ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 4x + 4}} = \sqrt{\frac{(x-4)(x+4)}{(x-1)(x-4)}} = \sqrt{\frac{x+4}{x-1}}$
 $Df = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

x	$-\infty$	-4	1	4	$+\infty$
$f(x)$	+	-	+	+	+

الف) $y = \sqrt{4 - \sqrt{2-x}}$
 $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4 \Rightarrow 2-x \leq 16 \Rightarrow x \geq -14$
 $Df = [-14, 2]$

ب) $y = \sqrt{3 - \sqrt{x-x}}$
 $3 - \sqrt{x-x} \geq 0 \Rightarrow \sqrt{x-x} \leq 3 \Rightarrow 0 \leq x-x \leq 9 \Rightarrow 0 \leq x \leq 9$
 $Df = [0, 9]$

الف) $y = \sqrt{4-2x^2} \Rightarrow |x|^2 \leq 2 \Rightarrow |x| \leq \sqrt{2} \Rightarrow \sqrt{2} \geq x \geq -\sqrt{2}$
 $Df = [-\sqrt{2}, \sqrt{2}]$

ب) $y = \sqrt{3|x|-9} \Rightarrow 3|x| \geq 9 \Rightarrow |x| \geq 3 \Rightarrow \begin{matrix} x \geq 3 \\ -3 \geq x \end{matrix}$
 $Df = (-\infty, -3] \cup [3, +\infty)$ (ب) ✓

الف) $y = \sqrt[3]{\frac{|x|+1}{|x|-3}} \Rightarrow |x| \neq 3 \Rightarrow x \neq \{3, -3\}$
 $Df = \mathbb{R} - \{3, -3\}$

ب) $y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \xrightarrow{x \geq 0} \sqrt{x} \neq 3 \Rightarrow x \neq 9$ (ب) ✓
 $Df = [0, +\infty) - \{9\}$

الف) $y = \frac{\sin x}{\cos x - 1} \Rightarrow \cos x \neq \frac{1}{2} \Rightarrow x \neq \{2k\pi \pm \frac{\pi}{3}\}$

ب) $y = \frac{\cos x + 1}{\sin x + 1} \Rightarrow \sin x \neq -\frac{1}{2} \Rightarrow Df = \mathbb{R} - \{2k\pi + \frac{11\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$ ا

ج) $y = \frac{\tan x + 1}{\cot x - 1} \Rightarrow Df = \mathbb{R} - \{\frac{k\pi}{2}, k\pi + \frac{\pi}{2}\}$ (ب) ✓

د) $y = \frac{\sin x}{\cos \tan x - 1} \Rightarrow Df = \mathbb{R} - \{k\pi \pm \frac{\pi}{2}\}$

$y = \frac{1}{\sqrt{|x-2|-\frac{1}{4}}} \Rightarrow 2|x-2| > \frac{1}{4} \Rightarrow |x-2| > \frac{1}{8} \Rightarrow x > \frac{9}{4} \text{ or } \frac{7}{4} > x$
 $Df = \mathbb{R} - [\frac{7}{4}, \frac{9}{4}]$ (ب) ✓

الف) $y = \sqrt{4-2|x|} \Rightarrow 2|x| \leq 4 \Rightarrow |x| \leq 2 \Rightarrow -2 \leq x \leq 2$
 $Df = [-2, 2]$

ب) $\sqrt{\frac{|x|}{1+|x|}}$ (+) ✓ (0) 0 (-) ✓
 $Df = \mathbb{R} - \{0\}$ (ب) ✓