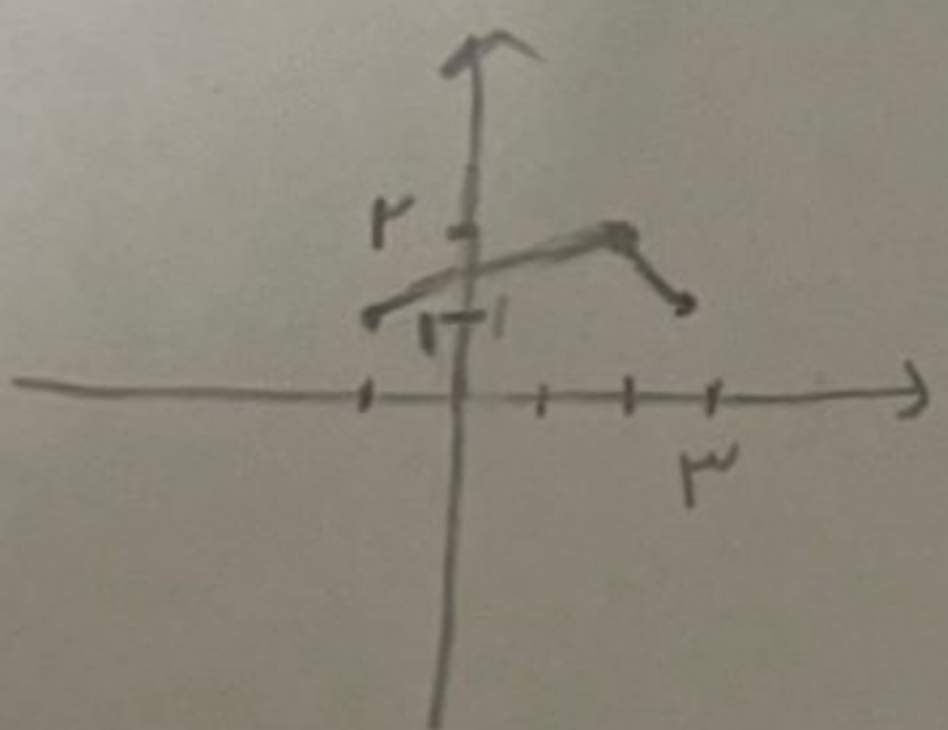
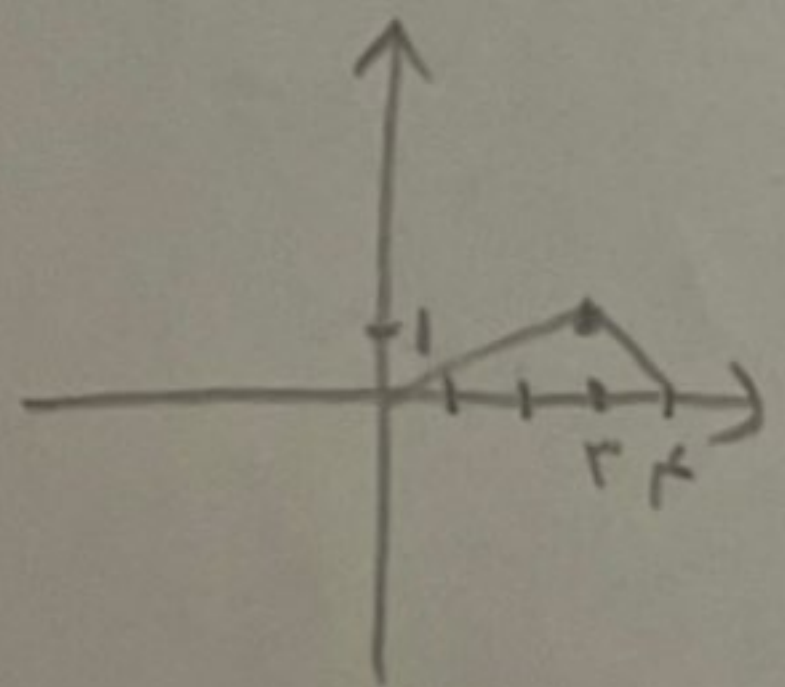
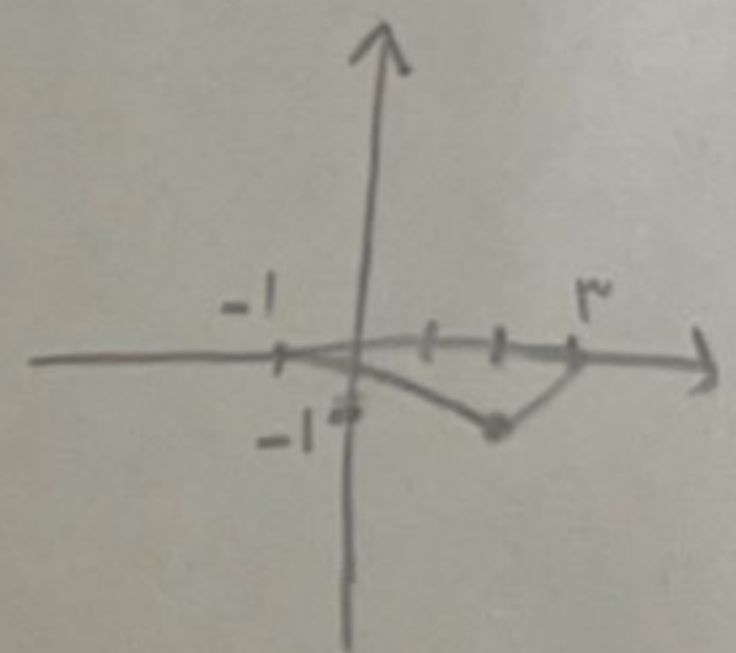
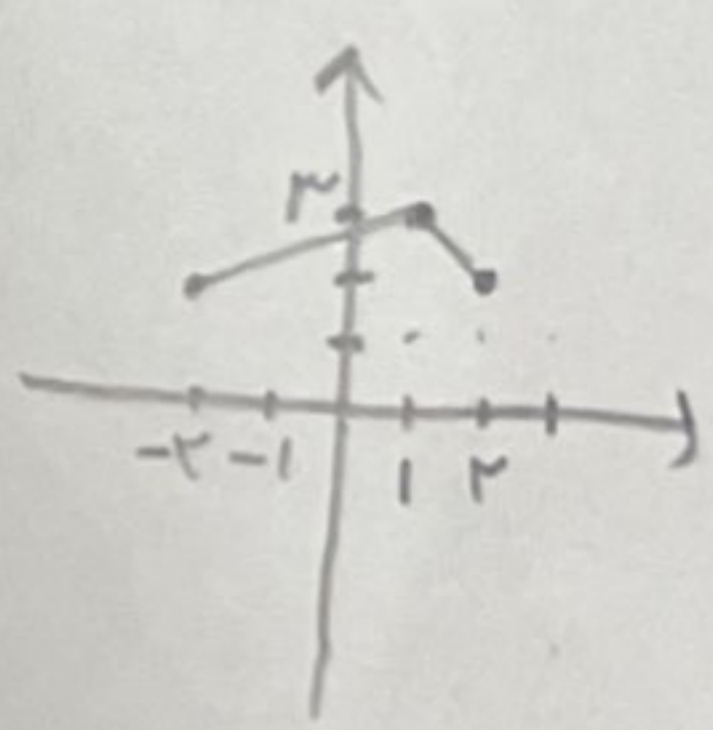


(الف) $y = \frac{x+4}{4x^3-20x^2+31x-14}$ $4x^3-20x^2+31x-14 \neq 0$ $4x^3-20x^2+31x-14 = (x-1)(4x^2-16x+15)$ $4x^2-16x+15 = 0 \Rightarrow x = \frac{16 \pm \sqrt{256-240}}{8} = \frac{16 \pm 4}{8}$ $x = \frac{5}{2}, \frac{3}{2}$ $D_f = \mathbb{R} - \{1, \frac{5}{2}, \frac{3}{2}\}$	(ب) $y = \frac{x+3}{3x^3-x^2-8x-6}$ $3x^3-x^2-8x-6 \neq 0$ جمع توان های زوج و فرد برابر $x=-1$ $3x^3-x^2-8x-6 = (x+1)(3x^2-4x-6)$ $3x^2-4x-6 = 0 \Rightarrow x = \frac{4 \pm \sqrt{16+72}}{6} = \frac{4 \pm 8}{6}$ $x = 2, -\frac{2}{3}$ $D_f = \mathbb{R} - \{-1, -\frac{2}{3}, 2\}$	1
(الف) $y = \frac{x+1}{x-\sqrt{3-2x}}$ $3-2x \geq 0 \Rightarrow 3 \geq 2x \Rightarrow \frac{3}{2} \geq x$ $x-\sqrt{3-2x} = 0 \Rightarrow x = \sqrt{3-2x} \rightarrow$ $\rightarrow x^2 = 3-2x \rightarrow x^2+2x-3 = 0$ $x = \frac{-2 \pm \sqrt{4+12}}{2} = 1, -3 \rightarrow x \neq 1$ $D_f = (-\infty, \frac{3}{2}] - \{1\}$	(ب) $y = \frac{x+2}{x-\sqrt{3x-2}}$ $3x-2 \geq 0 \Rightarrow 3x \geq 2 \Rightarrow x \geq \frac{2}{3}$ $x-\sqrt{3x-2} = 0 \rightarrow x = \sqrt{3x-2} \rightarrow x^2-3x+2=0$ $\rightarrow (x-1)(x-2)=0 \rightarrow x \neq 1, 2$ $D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$	2
(الف) $y = \frac{\sin x}{2\cos x-1}$ $2\cos x-1 \neq 0$ $2\cos x \neq 1$ $\cos x \neq \frac{1}{2}$ $D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$	(ب) $y = \frac{\cos x+1}{2\sin x+1}$ $2\sin x+1 \neq 0$ $2\sin x \neq -1$ $\sin x \neq -\frac{1}{2}$ $D_f = \mathbb{R} - \{2k\pi - \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$	3
(الف) $x^2-4x+4 > 0$ $(x-2)(x-2) > 0$ $2, 2$ $(-\infty, 2) \cup (2, +\infty)$	(ب) $x^2-4x+4 > 0$ $(x-1)(x-4) > 0$ $1, 4$ $(-\infty, 1) \cup (4, +\infty)$	
(الف) $x^2+5x+4 \geq 0$ $(x+1)(x+4) \geq 0$ $-1, -4$ $(-\infty, -4] \cup [-1, +\infty)$	(ب) $x^2-7x+4 \leq 0$ $(x-1)(x-4) \leq 0$ $1, 4$ $[1, 4]$	4
(الف) $\frac{x^2-3x+2}{x-4} < 0$ $x-4 = 0 \rightarrow x=4$ $x^2-3x+2 = 0 \rightarrow (x-1)(x-2) = 0$ $1, 2$ $\frac{x}{1} \quad \frac{2}{-} \quad \frac{4}{-}$ $(-\infty, 1) \cup (2, 4)$	(ب) $\frac{x^2-1}{x^2-5x+4} \geq 0$ $x^2-5x+4 \geq 0 \rightarrow (x-1)(x-4) \geq 0$ $1, 4$ $x^2-1 \geq 0 \rightarrow (x-1)(x+1) \geq 0$ $1, -1$ $\frac{x}{-1} \quad \frac{1}{+} \quad \frac{4}{-} \quad \frac{-1}{+}$ $[-1, 1) \cup (4, +\infty)$	5

$y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}} \quad (الف)$ $\frac{x^2 - 4x + 3}{x^2 - 1} \geq 0 \rightarrow \frac{(x-1)(x-3)}{(x-1)(x^2+1)} \geq 0$ $\frac{x-3}{x^2+1} \geq 0 \quad x^2-1 \neq 0 \rightarrow x^2 \neq 1$ $\hookrightarrow x-3 \geq 0 \rightarrow x \geq 3$ $D_f = [3, +\infty)$	$y = \sqrt{\frac{x^2 - 1^2 x + 1}{x^2 - 1}} \quad (ب)$ $x^2 - 1 \neq 0 \rightarrow x \neq \pm 1$ $D_f = (-\infty, -1) \cup (-1, 1) \cup (1, +\infty)$	٤																								
$y = \log(x^2 - 3x) \quad (الف)$ $x^2 - 3x > 0$ $x(x-3) > 0$ $x < 0 \quad x > 3$ $D_f = (-\infty, 0) \cup (3, +\infty)$	$y = \log \frac{4-x^2}{ x -2} \quad (ب)$ $ x -2 > 0 \rightarrow x > 2, x < -2$ $ x -2 < 0 \rightarrow -2 < x < 2$ $4-x^2 > 0 \rightarrow -2 < x < 2$ $D_f = (-2, -1) \cup (1, 2)$	$y = \log \frac{x^2 - 5x + 4}{10-x} \quad (ج)$ $\frac{(x-4)(x-1)}{10-x} > 0$ $x \neq 10$ $x-4 > 0 \rightarrow x > 4$ $10-x > 0 \Rightarrow x < 10$ $D_f = (4, 10)$	$y = \sqrt{x^2 - 11x + 28} + \log_{\sqrt{1/2}} x$ $x^2 - 11x + 28 \geq 0$ $(x-4)(x-7) \geq 0 \begin{cases} x \leq 4 \\ x \geq 7 \end{cases}$ $\sqrt{x^2 - 11x + 28} > 0 \rightarrow x^2 - 11x + 28 > 0$ $\hookrightarrow -7 < x < 4$ $x > 0 \begin{cases} 0 < x < 4 \\ x \geq 7 \end{cases}$ $\sqrt{x^2 - 11x + 28} \geq 0 \rightarrow x \leq 4, x \geq 7$ $0 < x \leq 4$ $D_f = (0, 4]$	٧																						
$y = \frac{x^2 - x}{x^2 + x} = \frac{x(x-1)}{x(x+1)}$ <table><tr><td></td><td>-1</td><td>0</td><td>1</td></tr><tr><td>$x^2 - x$</td><td>+</td><td>+</td><td>-</td></tr><tr><td>$x^2 + x$</td><td>+</td><td>-</td><td>+</td></tr><tr><td>$p(x)$</td><td>+</td><td>-</td><td>+</td></tr></table>		-1	0	1	$x^2 - x$	+	+	-	$x^2 + x$	+	-	+	$p(x)$	+	-	+	$y = \frac{x^2 - x}{x^2 + x}$ <table><tr><td>x</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>$p(x)$</td><td>+</td><td>-</td><td>+</td></tr></table>	x	-1	0	1	$p(x)$	+	-	+	٨
	-1	0	1																							
$x^2 - x$	+	+	-																							
$x^2 + x$	+	-	+																							
$p(x)$	+	-	+																							
x	-1	0	1																							
$p(x)$	+	-	+																							
$y = \sqrt{\frac{x-f(x)}{f(x)}}$ <table style="margin-right: 20px;"><tr><td>$f(x)$</td><td>-1</td><td>2</td></tr><tr><td>$f(x)$</td><td>+</td><td>-</td></tr></table> دائماً فرض در دامنه مثبت $\frac{x-f(x)}{f(x)} \geq 0$ $f(x) > 0$$x-f(x) \geq 0 \rightarrow x \geq f(x)$ $f(x) < 0$$x-f(x) \leq 0 \rightarrow x \leq f(x)$ $D_f = (2, +\infty)$	$f(x)$	-1	2	$f(x)$	+	-		٩																		
$f(x)$	-1	2																								
$f(x)$	+	-																								
$f(x)+1 \quad (الف)$ 	$f(x+1) \quad (ب)$ 	$-f(x) \quad (ج)$ 	$f(x+1)+2 \quad (د)$ 	١٠																						