

الف) $y = \frac{x+4}{4x^2-2x^2+31x-15} \rightarrow \text{تجزیه به کسرها} \rightarrow \frac{(x-1)(x^2-14x+15)}{(x-1)(x-2)(x-15)} \rightarrow \frac{(x-2)(x-15)}{(x-1)(x-2)(x-15)} \rightarrow \frac{1}{x-1}$
 $D_f = \mathbb{R} - \{1, \frac{15}{2}\}$

ب) $y = \frac{x+3}{3x^2-x^2-18x-4} \rightarrow \text{تجزیه به کسرها} \rightarrow \frac{(x+1)(x^2-4x-4)}{(x-1)(x-2)(x-4)} \rightarrow \frac{(x+1)(x-2)(x-4)}{(x-1)(x-2)(x-4)} \rightarrow \frac{x+1}{x-1}$
 $D_f = \mathbb{R} - \{1, -\frac{1}{2}\}$

الف) $y = \frac{x+1}{x-\sqrt{3-2x}}$
 $3-2x \geq 0 \rightarrow x \leq \frac{3}{2} \rightarrow \frac{x}{2} \geq \frac{1}{2} \rightarrow x \geq 1$
 $x-\sqrt{3-2x} \neq 0 \rightarrow x \neq \sqrt{3-2x} \rightarrow x^2 \neq 3-2x \rightarrow x^2+2x-3 \neq 0 \rightarrow (x+3)(x-1) \neq 0$
 $x \neq -3, x \neq 1$
 $D_f = [\frac{1}{2}, +\infty) - \{1\}$

ب) $y = \frac{x+2}{x-\sqrt{3x-2}}$
 $3x-2 \geq 0 \rightarrow x \geq \frac{2}{3} \rightarrow x \geq \frac{2}{3}$
 $x-\sqrt{3x-2} \neq 0 \rightarrow x \neq \sqrt{3x-2} \rightarrow x^2 \neq 3x-2 \rightarrow x^2-3x+2 \neq 0 \rightarrow (x-1)(x-2) \neq 0$
 $x \neq 1, x \neq 2$
 $D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$

الف) $y = \frac{\sin x}{2\cos x - 1}$
 $2\cos x - 1 \neq 0 \rightarrow 2\cos x \neq 1 \rightarrow \cos x \neq \frac{1}{2}$
 $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\}$

ب) $y = \frac{\cos x + 1}{2\sin x + 1}$
 $2\sin x + 1 \neq 0 \rightarrow 2\sin x \neq -1 \rightarrow \sin x \neq -\frac{1}{2}$
 $D_f = \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\}$

ج) $y = \frac{\tan x + 2}{\cot x - 1}$
 $\frac{\cos x}{\sin x} - 1 \neq 0 \rightarrow \frac{\cos x}{\sin x} \neq 1 \rightarrow \cos x \neq \sin x$
 $D_f = \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4}\}$

د) $y = \frac{\sin x + 1}{4\sin^2 x - 3}$
 $4\sin^2 x - 3 \neq 0 \rightarrow 4\sin^2 x \neq 3 \rightarrow \sin^2 x \neq \frac{3}{4} \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{2}$
 $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{3}, k\pi + \frac{2\pi}{3}\}$

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

ب) $x^2 - 6x + 5 < 0$
 $(x-1)(x-5) < 0$
 $D_f = (1, 5)$

ج) $x^2 + 6x + 5 \geq 0$
 $(x+1)(x+5) \geq 0$
 $D_f = (-\infty, -5] \cup [-1, +\infty)$

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

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

ب) $\frac{x^2-1}{x^2-6x+5} \geq 0$
 $(x-1)(x+1) \geq 0$
 $D_f = (-\infty, -1] \cup (5, +\infty)$

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الف) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}}$

ب) $y = \sqrt{\frac{x^2 - 4x + 3}{x^2 - 1}}$

$Df = [3, +\infty)$

$Df = \mathbb{R} - \{1, -1\}$

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الف) $y = \log(x^2 - 3x)$

ب) $y = \log_{10} \frac{x^2 - 4x + 3}{x^2 - 1}$

ج) $y = \log_{10} \frac{x^2 - 4x + 3}{x^2 - 1}$

د) $y = \sqrt{x^2 - 11x + 28} + \log_x \sqrt{49 - x^2}$

$Df = (-\infty, 0) \cup (3, +\infty)$

$Df = (-4, -2) \cup (2, 4) - \{+3, -3\}$

$Df = (3, 10) - \{2\}$

$Df = (0, 4] - 1$

$Df = (-4, 4)$

$Df = (0, 4] - 1$

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$y = \frac{x^2 - x}{x^2 + x}$

$Df = (-\infty, -1) \cup (1, +\infty)$

$x^2 - x$	+	+	-	+
$x^2 + x$	+	-	+	+
$P(x)$	+	-	-	+

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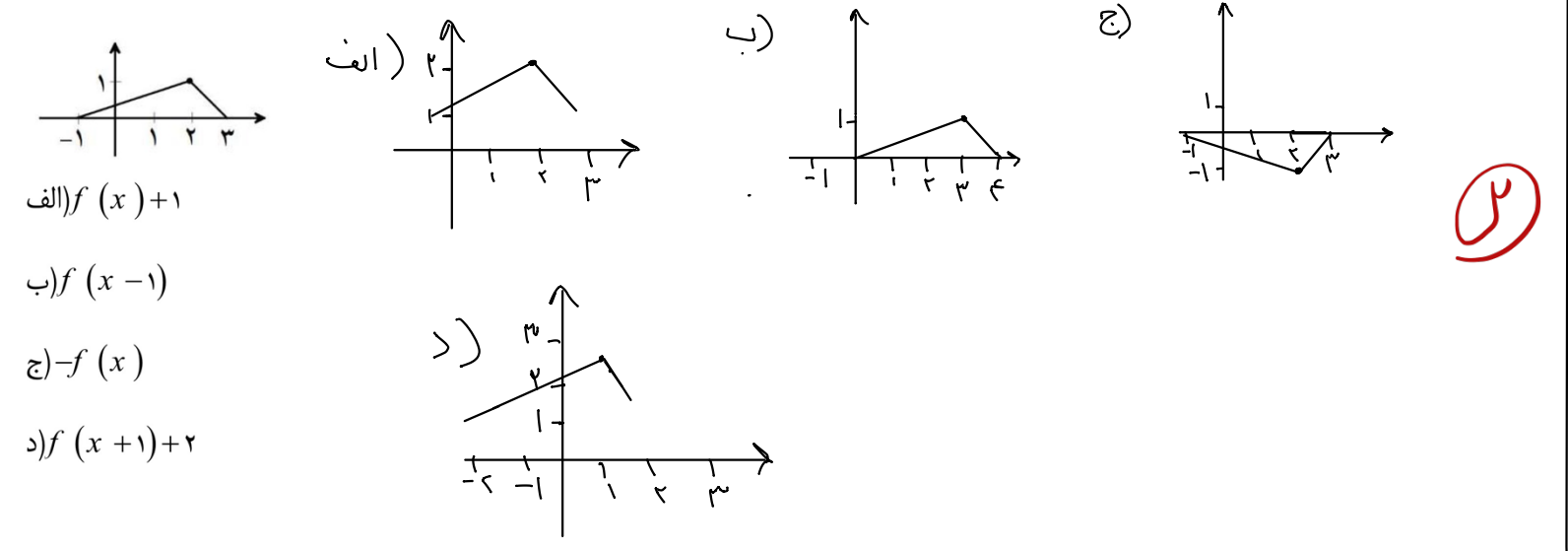
$y = \sqrt{\frac{x - f(x)}{f(x)}}$

$Df = [-2, -1] \cup (2, 3]$

$x - f(x)$	-	-	+	+	-
$f(x)$	+	-	-	+	+
$P(x)$	-	+	0	-	+

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