-۵

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

$1 \quad 2 \quad 5$: $- \; + \; - \; +$ $\quad (-\infty \;\; 1] \cup [2 \;\; 5)$

$x^2-1 \to (x+1)(x-1)$

$x^2-6x+5 \to (x-5)(x-1)$

$-1 \quad 1 \quad 5$: $+ \; - \; - \; +$ $\quad (-\infty \;\; -1] \cup (5 \;\; +\infty) + \{1\}$

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-۶

ب) $\sqrt{\frac{x^2-4x+3}{x^2-1}}$ $\quad x^2-1 \neq 0 \Rightarrow x \neq 1$

$\frac{x^2-4x+3}{x^3-1} \geq 0$ → $x^2-4x+3=(x-1)(x-3)$, $x^3-1 \to (x-1)(x^2+x+1)$ $\Rightarrow \frac{(x-1)(x-3)}{(x-1)(x^2+x+1)}$, $x \neq 1$

$\frac{x-3}{x^2+x+1} \geq 0 \Rightarrow x \geq 3 \qquad D_f=[3 \;\; +\infty)$

۱٫۷۵

ج) $\sqrt[3]{\frac{x^2-4x+3}{x^2-1}}$ $\quad x^2-1 \neq 0 \Rightarrow x^2 \neq 1 \to x \neq \pm 1$

$D_f = \mathbb{R} - \{\pm 1\}$

-۷

الف) ~~[illegible]~~ $x^2-3x = x(x-3) > 0 \Rightarrow x > 0 \qquad D_f = (-\infty \;\; 0) \cup (3 \;\; \infty)$

$16-x^2>0$

$|x|-2>0 \quad |x|-3 \neq 0 \quad -4<x<4 \quad x>2, x<-2 \quad x \neq \pm 3 \qquad D_f=(-4,-2)\cup(2,4)-\{-3,3\}$

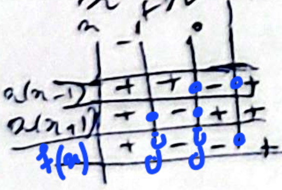
ج) $\left(\frac{x^2-7x+12}{x-3}\right) \to \frac{(x-3)(x-4)}{(x-3)} \to x-4>0 \Rightarrow x>4 \qquad D_f=(4 \;\; \infty)$ $\quad D_f=(4,10]-\{9\}$

۱٫۵

د) $16-x^2>0 \Rightarrow -4<x<4$ $\quad x^2-11x+28=(x-7)(x-4)\geq 0 \Rightarrow x \leq 4$ یا $x \geq 7$ $\quad x>0, x\neq 1$ $\quad D_f = \boxed{(0 \;\; 1)\cup(1 \;\; 4]}$

$\frac{x^2-x}{x^2+x} \to \frac{x(x-1)}{x(x+1)}$ $\quad 0, 1, -1$

$-1 \quad 0 \quad 1$: $+ \; - \; - \; +$



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$y=\sqrt{\frac{2-f(x)}{f(x)}}$

$D_f=(-2,-1] \cup (2,3]$

$D_f = (-\infty, -2) \cup (2, \infty) \cup \{-1\}$

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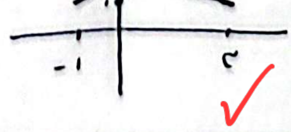

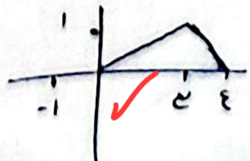

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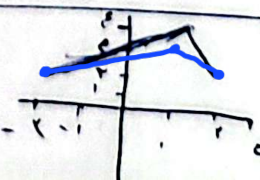

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۱- الف) $\dfrac{x+4}{4x^3-20x^2+31x-15} \rightarrow 4x^3-20x^2+31x-15=(x-1)(2x-5)(2x-3)$

$x=1$ و $x=2/5$ و $x=1/5$

$D_f=\mathbb{R}-\{1, 2/5, 1/5\}$

۲

ب) $\dfrac{x+3}{3x^3-x^2-8x+4} \rightarrow 3x^3-x^2-8x-4=(x-2)(x+1)(3x+2)$

$x=2, x=-1, x=-\frac{2}{3}$ $\quad D_f=\mathbb{R}-\{2, -1, -\frac{2}{3}\}$

۲- الف) $\dfrac{x+1}{x-\sqrt{3-2x}}$

$\sqrt{3-2x}\geq 0 \rightarrow 3-2x\geq 0 \rightarrow 3\geq 2x \rightarrow \frac{3}{2}\geq x$

$x-\sqrt{3-2x}\geq 0 \Rightarrow x\geq \sqrt{3-2x} \rightarrow x^2\geq 3-2x \rightarrow x^2+2x\geq 3$

$x^2+2x-3\neq 0 \rightarrow (x+3)(x-1)$

$\underset{\times}{x=-3}$ $\quad \underset{\checkmark}{x=1}$

$-3-\sqrt{3+6} \Rightarrow -3-3=-6$

$(-\sqrt{3-2}=0)$ قبول

$D_f=(-\infty, \frac{3}{2}]-\{1\}$

۲

ب) $\dfrac{x+2}{x-\sqrt{2x-2}}$ $\quad \sqrt{2x-2}\geq 0 \rightarrow 2x-2\geq 0 \rightarrow 2x\geq 2 \rightarrow x\geq \frac{2}{3}$

$x-\sqrt{2x-2}\geq 0 \Rightarrow x\geq\sqrt{2x-2} \rightarrow x^2=2x-2 \Rightarrow x^2-2x+2=0$

$(x-2)(x-1) \rightarrow x=1$, $x=2$

$D_f=[\frac{2}{3}, +\infty)-\{1, 2\}$

۳- الف) $\dfrac{\sin x}{2\cos x-1}$

$2\cos x-1=0 \Rightarrow \cos x=\frac{1}{2}$

$x=\pm\frac{\pi}{3}+2k\pi \quad (k\in\mathbb{Z})$

$\mathbb{R}-\{\pm\frac{\pi}{3}+2k\pi : k\in\mathbb{Z}\}$

ب) $\dfrac{\cos x+1}{2\sin x+1}$

$2\sin x \neq -1 \rightarrow \sin x=\frac{-1}{2}$

$x=-\frac{\pi}{6}+2k\pi$ و $x=\frac{7\pi}{6}+2k\pi \; (k\in\mathbb{Z})$

$\mathbb{R}-\{-\frac{\pi}{6}+2k\pi, \frac{7\pi}{6}+2k\pi : k\in\mathbb{Z}\}$

۱/۷۵

ج) $\cot x-1=0 \Rightarrow \cot x=1$

$\tan x=1 \Rightarrow x=\frac{\pi}{4}+k\pi$

$\mathbb{R}-\{k\pi, \frac{\pi}{2}+k\pi, \frac{\pi}{4}+k\pi : k\in\mathbb{Z}\}$

د) $x=\frac{\pi}{3}+2k\pi, \frac{2\pi}{3}+2k\pi, \frac{4\pi}{3}+2k\pi, \frac{5\pi}{3}+2k\pi$

$\mathbb{R}-\{x: \sin x=\pm\frac{\sqrt{3}}{2}\}$

$\mathbb{R}-\{k\pi\pm\frac{\pi}{3}\}$

۴- الف) $x^2-5x+6>0 \quad (x-3)(x-2)$ $\quad x=3$, $x=2$

	2		3	
+		−		+

ب) $x^2-6x+5\leq 0 \quad (x-1)(x-5)$

	1		5	
+		−		+

ج) $x^2+6x+5\geq 0 \quad (x+1)(x+5)$

	−5		−1	
+		−		+

$D_f=(-\infty, -5]\cup[-1, +\infty)$

۱/۵

د) $x^2-7x+6\leq 0 \quad (x-1)(x-6)$

	1		6	
+		−		+