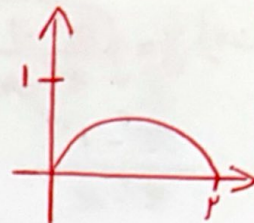
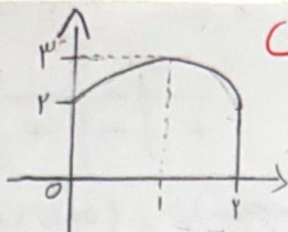


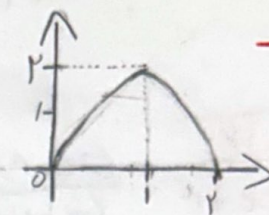
الف) $f(x) + 2 =$

۱۸، ۵

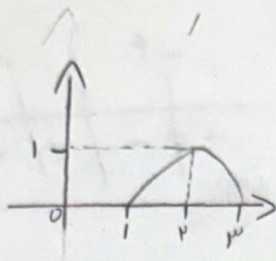
$f(x)$ سوفیاء عسکری



ب) $2f(x) =$

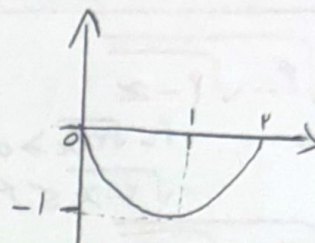


ج) $f(x-1) =$



د) $-f(x) =$

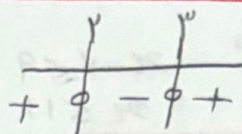
۲ ✓



الف) $x^2 - 5x + 6 > 0$

$(x-2)(x-3)$

$x=2, x=3$

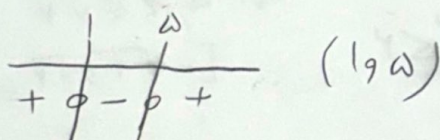


$(-\infty, 2) \cup (3, +\infty)$

ب) $x^2 - 6x + 5 < 0$

$(x-1)(x-5)$

$x=1, x=5$

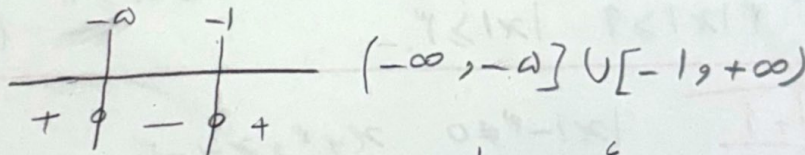


$(1, 5)$

ج) $x^2 + 4x + 5 > 0$

$(x+1)(x+5)$

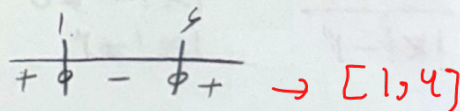
$x=-1, x=-5$



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

د) $x^2 - 7x + 6 \leq 0$

$(x-1)(x-6) \rightarrow x=1, x=6$



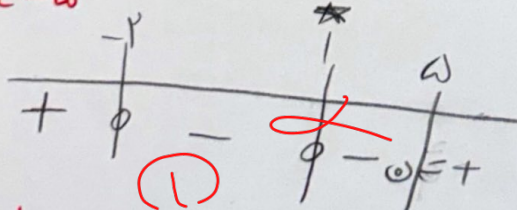
$[1, 6]$

الف) $\frac{x^2 - 3x + 2}{x-5} < 0$

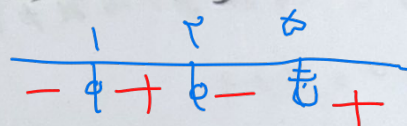
$\rightarrow (x-1)(x-2) \rightarrow x=1, x=2$

$x=5$

$\frac{(x-1)(x-2)}{(x-5)}$



$(-2, 1) \cup (1, 5)$

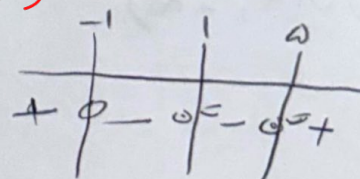


ب) $\frac{x^2 - 1}{x^2 - 6x + 5} \geq 0$

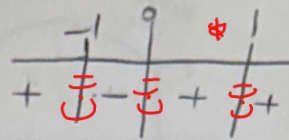
$(-\infty, -1) \cup (2, 5)$

$\frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0 \rightarrow x=-1, x=1, x=5$

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

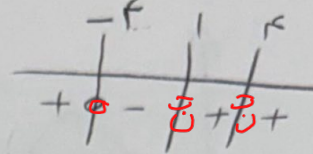


$$\text{الف) } y = \sqrt{\frac{x^3-1}{x^3-x}} = \frac{(x-1)(x^2+x+1)}{(x+1)x(x-1)}$$



$$D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$$

$$\text{ب) } y = \sqrt{\frac{x^2-14}{x^2-5x+4}} = \frac{(x-4)(x+4)}{(x-1)(x-4)}$$



$$D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$$

$$\text{الف) } y = \sqrt{4-\sqrt{2-x}}$$

$$2-x \leq 4$$

$$-x \leq 14 \rightarrow x \geq -14$$

$$-14 \leq x \leq 2 \quad [-14, 2]$$

$$2-x \geq 0 \quad 4-\sqrt{2-x} \geq 0$$

$$x \leq 2$$

$$\sqrt{2-x} \leq 4$$

✓

$$\text{ب) } y = \sqrt{3-\sqrt{x-2}}$$

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

$$x-2 \leq 9$$

$$2 \leq x \leq 11$$

$$[2, 11]$$

$$x-2 \geq 0 \rightarrow x \geq 2$$

$$\sqrt{x-2} \leq 3$$

$$x \leq 11$$

دامنه توابع

$$\text{الف) } y = \sqrt{4-2x^2}$$

$$4-2x^2 \geq 0$$

$$2x^2 \leq 4 \rightarrow x^2 \leq 2$$

$$-\sqrt{2} \leq x \leq \sqrt{2}$$

$$[-\sqrt{2}, \sqrt{2}]$$

$$\text{ب) } y = \sqrt{3|x|-9}$$

$$3|x|-9 \geq 0 \quad 3|x| \geq 9 \quad |x| \geq 3$$

$$x \leq -3 \quad \text{or} \quad x \geq 3$$

$$(-\infty, -3] \cup [3, +\infty)$$

دامنه توابع

$$\text{الف) } y = \sqrt[3]{\frac{|x|+1}{|x|-3}}$$

$$|x|-3 \neq 0$$

$$x \neq 3, x \neq -3$$

$$|x| \neq 3$$

$$D_f = (-\infty, -3) \cup (-3, 3) \cup (3, +\infty)$$

$$\text{ب) } y = \sqrt[3]{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \rightarrow x \geq 0$$

✓

$$\sqrt{x}-3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9$$

$$x \geq 0, x \neq 9$$

$$[0, 9) \cup (9, +\infty)$$

الف) $y = \frac{\sin x}{1 - \cos x} =$

$x \neq 2k\pi \pm \frac{\pi}{2}$

$1 - \cos x \neq 0 \quad \cos x \neq 1$

$D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{2} \mid k \in \mathbb{Z}\}$

ب) $y = \frac{\cos x + 1}{1 - \sin x} =$

$x = \frac{\pi}{2} + 2k\pi$

$D_f = \mathbb{R} - \{\frac{\pi}{2} + 2k\pi, \frac{3\pi}{2} + 2k\pi \mid k \in \mathbb{Z}\}$

$1 - \sin x \neq 0 \quad \sin x \neq 1$

$x = \frac{3\pi}{2} + 2k\pi$

ج) $y = \frac{\tan x + 1}{\cot x - 1} =$

$\cot x - 1 \neq 0$

$\cot x \neq 1$

$\cos x \neq 0 \quad x \neq \frac{k\pi}{2}$

$\sin x \neq 0$

$x \neq \frac{\pi}{4} + k\pi$

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

د) $y = \frac{\sin x + 1}{1 - \sin^2 x - 1} =$

$\sin x \neq \pm \frac{\sqrt{3}}{2}$

$D_f = \mathbb{R} - \{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6} + 2k\pi \mid k \in \mathbb{Z}\}$

$1 - \sin^2 x - 1 \neq 0 \rightarrow 1 - \sin^2 x \neq 1 \rightarrow \sin^2 x \neq \frac{3}{4}$

$y = \frac{1}{\sqrt{2|x-1| - \frac{1}{2}}}$

$x-1 < -\frac{1}{2} \quad , \quad x-1 > \frac{1}{2}$

$x < \frac{1}{2} \quad , \quad x > \frac{3}{2}$

$2|x-1| - \frac{1}{2} > 0$

$(-\infty, \frac{1}{2}) \cup (\frac{3}{2}, +\infty)$

$2|x-1| > \frac{1}{2} \rightarrow |x-1| > \frac{1}{4}$

دامنه تابع

الف) $y = \sqrt{4 - 2|x|}$

$4 - 2|x| \geq 0$

$2|x| \leq 4$

$|x| \leq 2$

$-2 \leq x \leq 2$

$D_f = [-2, 2]$

ب) $y = \sqrt{\frac{|x|}{|x|}}$

$\frac{|x|}{|x|} \geq 0$

$x \neq 0$

$|x| \neq 0$

$x \neq 0$

$\frac{|x|}{|x|} = 1$

$D_f = (-\infty, 0) \cup (0, +\infty)$

دامنه تابع