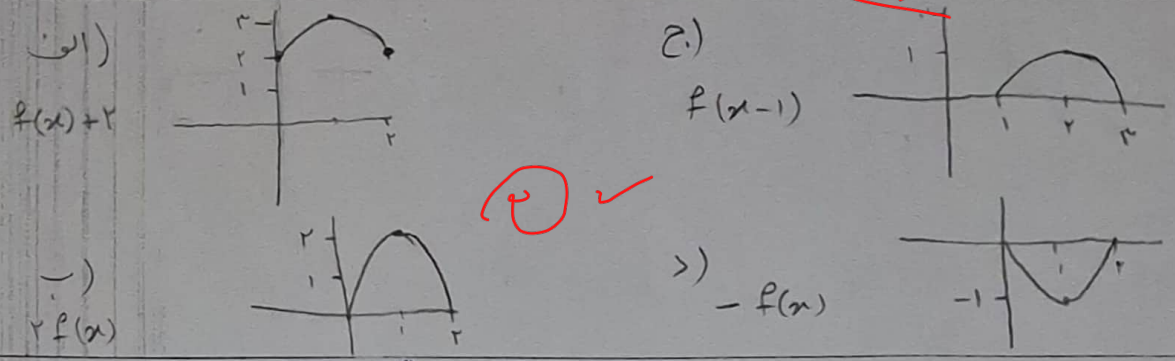
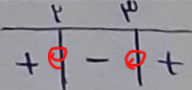
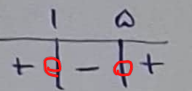
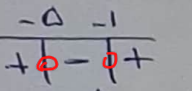


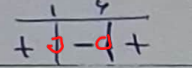
۱۹,۱۲۵

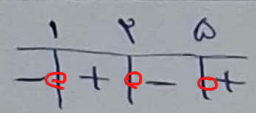


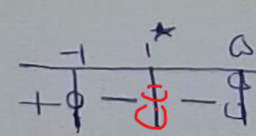
الف)  $(x-2)(x-2) > 0$    $(-\infty, 2) \cup (2, +\infty)$  ممنوعه‌های ریاضی

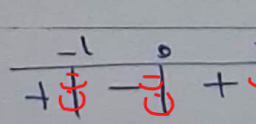
ب)  $(x-1)(x-5) < 0$    $(1, 5)$

ج)  $(x+1)(x+5) \geq 0$    $(-\infty, -5] \cup [-1, +\infty)$

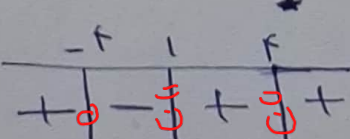
د)  $(x-1)(x-3) \leq 0$    $[1, 3]$

الف)  $\frac{(x-1)(x-2)}{x(x-5)} < 0$    $(-\infty, 1) \cup (2, 5)$

ب)  $\frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$    $(-\infty, -1] \cup (5, +\infty)$

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

$x = \pm 1$

ب)  $\frac{x^3-16}{x^3-5x+4} \geq 0$    $D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

الف)  $x-2 \geq 0 \Rightarrow x \geq 2$  ①  $4-\sqrt{x-2} \geq 0 \Rightarrow \sqrt{x-2} \leq 2 \Rightarrow x-2 \leq 4 \Rightarrow x \leq 6$  ②  $x \geq -14$  ③

①, ②  $\Rightarrow -14 \leq x \leq 2 \Rightarrow D_f = [-14, 2]$

ب)  $x-2 \geq 0 \Rightarrow x \geq 2$  ①  $3-\sqrt{x-2} \geq 0 \Rightarrow \sqrt{x-2} \leq 3 \Rightarrow x-2 \leq 9 \Rightarrow x \leq 11$  ②

①, ②  $\Rightarrow 2 \leq x \leq 11 \Rightarrow D_f = [2, 11]$

الف)  $\epsilon - 2x^2 \geq 0 \quad 2x^2 \leq \epsilon \quad x^2 \leq \frac{\epsilon}{2} \quad -\sqrt{\frac{\epsilon}{2}} \leq x \leq \sqrt{\frac{\epsilon}{2}} \quad D_f = \left[-\sqrt{\frac{\epsilon}{2}}, \sqrt{\frac{\epsilon}{2}}\right]$

(2) ✓

ب)  $x|x| - 9 \geq 0 \quad x|x| > 9 \quad x > 3 \quad D_f = (-\infty, -3] \cup [3, +\infty)$   
 $|x| > 3 \quad x \leq -3$

الف)  $|x| - 3 \neq 0 \quad |x| \neq 3 \quad x \neq \pm 3 \quad D_f = \mathbb{R} - \{\pm 3\}$

(2) ✓

ب)  $\sqrt{x} - 3 \neq 0 \Rightarrow \sqrt{x} \neq 3 \Rightarrow x \neq 9 \quad D_f = [0, +\infty) - \{9\}$   
 $x > 0$

الف)  $2\cos x - 1 \neq 0 \quad 2\cos x \neq 1 \quad \cos x \neq \frac{1}{2} \quad x \neq \frac{\pi}{3}, \frac{5\pi}{3} \quad D_f = \mathbb{R} - \left\{\frac{\pi}{3}, \frac{5\pi}{3}\right\}$

ب)  $2\sin x + 1 \neq 0 \quad 2\sin x \neq -1 \quad \sin x \neq -\frac{1}{2} \quad x \neq \frac{7\pi}{6}, \frac{11\pi}{6} \quad D_f = \mathbb{R} - \left\{\frac{7\pi}{6}, \frac{11\pi}{6}\right\}$

ج)  $\begin{cases} \tan x \rightarrow \frac{\sin x}{\cos x} \rightarrow \cos x \neq 0 \rightarrow x \neq k\pi + \frac{\pi}{2} \\ \cot x \rightarrow \frac{\cos x}{\sin x} \rightarrow \sin x \neq 0 \rightarrow x \neq k\pi \end{cases} \quad D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{2}, k\pi\right\}$

د)  $\cot x - 1 \neq 0 \rightarrow \cot x \neq 1 \rightarrow x \neq k\pi + \frac{\pi}{4} \quad D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{4}\right\}$

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

$2|x - 2| > \frac{1}{x} \quad |x - 2| > \frac{1}{2x}$   
 $x - 2 > \frac{1}{2x} \Rightarrow x > \frac{4}{x} \quad D_f = (-\infty, \frac{4}{x}) \cup (\frac{4}{x}, +\infty)$   
 $x - 2 < -\frac{1}{2x} \Rightarrow x < \frac{4}{x}$

الف)  $f - 2|x| \geq 0 \Rightarrow 2|x| \leq f \Rightarrow |x| \leq \frac{f}{2} \quad -\frac{f}{2} \leq x \leq \frac{f}{2} \quad D_f = \left[-\frac{f}{2}, \frac{f}{2}\right]$

(2) ✓

ب)  $\frac{|x|}{|x|} \geq 0 \quad x \neq 0 \quad D_f = \mathbb{R} - \{0\}$