

الف) $y^3 - x = 2x^2 \Rightarrow \begin{cases} y_1^3 = 2x^2 + x \\ y_2^3 = 2x^2 + x \end{cases} \rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2 \checkmark$

۱

ب) $|y| + x^2 = x + 3 \xrightarrow{x=0} |y| = 3 \rightarrow y = \pm 3 \times$

ج) $\sqrt{x-4} + |y-2| = 0 \xrightarrow{\text{مشتق}} \sqrt{x-4} = |y-2| = 0 \rightarrow x=4, y=2 \checkmark$
 جمع مشتقات منفی و مثبت خودشان منفی باشند

د) $x = \cos y \xrightarrow{x=0} 0 = \cos y \rightarrow y = 90, 270 \times$

الف) $y = \frac{x+4}{x^2-4x} = \frac{x+4}{x(x-4)} \rightarrow x \neq 0, 4 \rightarrow D_f = \mathbb{R} - \{0, 4\} \mid D_f = (-\infty, 0) \cup (4, +\infty)$

ب) $y = \frac{x+4}{x^2-4x+4} \rightarrow \Delta = b^2 - 4ac = 4^2 - 4 \cdot 1 \cdot 4 = 0 \rightarrow \Delta = 0 \rightarrow D_f = \mathbb{R}$

ج) $y = \frac{x+4}{x^2+x+4} \rightarrow \Delta = b^2 - 4ac = 1 - 4 = -3 \rightarrow \Delta < 0 \rightarrow D_f = \mathbb{R}$

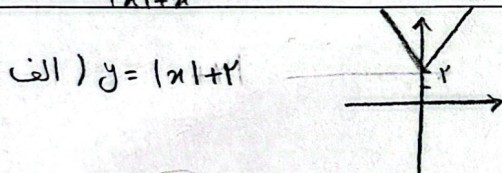
د) $y = \frac{x+4}{x^2-4x^2} \rightarrow \frac{x+4}{x^2(x-4)} \rightarrow D_f = \mathbb{R} - \{0, 4\} \mid D_f = (-\infty, -2) \cup (-2, 0) \cup (0, 2) \cup (2, +\infty)$

الف) $y = \sqrt{4-x} + \sqrt{x-2} \rightarrow 4-x \geq 0 \rightarrow x \leq 4, x-2 \geq 0 \rightarrow x \geq 2 \Rightarrow 2 \leq x \leq 4 \rightarrow D = [2, 4]$

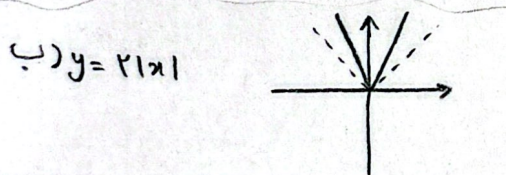
ب) $y = \frac{x^2+1}{x^2+1} \rightarrow D = \mathbb{R}$ ☆ مخرج همواره +

ج) $y = \frac{\sqrt{x-2}}{x-4} \rightarrow x-4 \neq 0 \rightarrow x \neq 4, x-2 \geq 0 \rightarrow x \geq 2 \Rightarrow D = [2, 4) \cup (4, +\infty)$

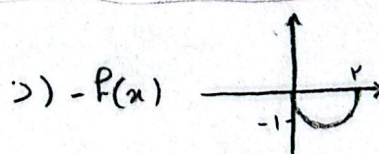
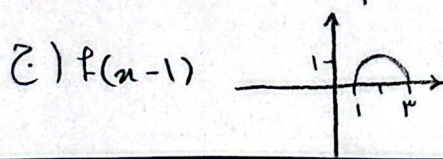
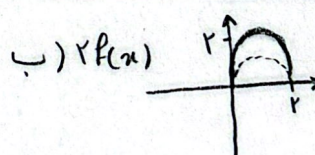
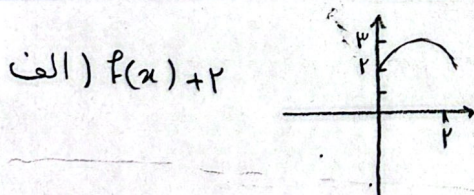
د) $y = \frac{x^2+3}{|x|+x^2} \rightarrow |x|+x^2 \neq 0 \rightarrow x \neq 0 \Rightarrow D = \mathbb{R} - \{0\} \rightarrow D = (-\infty, 0) \cup (0, +\infty)$

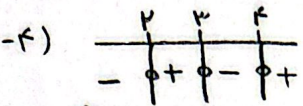


ج) $y = |x+2|$



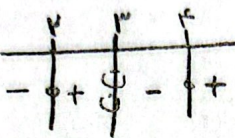
د) $y = |x+2| + 3$



الف) $y = (x-2)(x-3)(x-4)$  $y = (x-2)(x-3)(x-4)$

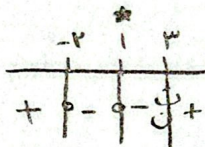
ب) $y = (x-2)(x-3)^2(x-4)$ 

٦

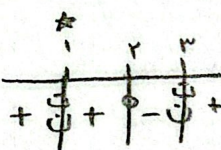
الف) $y = \frac{(x-2)(x-4)}{x-3}$ 

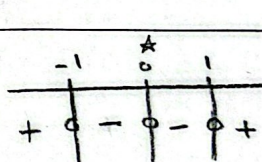
٧

ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$ 

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

٨

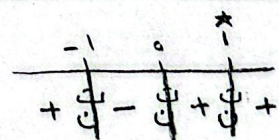
ب) $y = \frac{x^3-3x^2}{x^2-4x+3} = \frac{(x-1)(x-2)}{(x-1)(x-3)}$ 

الف) $y = \frac{x^2-x^2}{x^2+x+2} = \frac{x^2(x+1)(x-1)}{x^2+x+2} \leadsto x^2+x+2 > 0 \rightarrow \Delta < 0$ 

٩

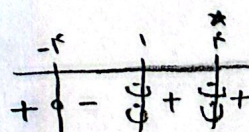
ب) $y = \frac{x^2+3x+2}{x^2+2x+3} \leadsto x^2+3x+2 > 0 \rightarrow \Delta < 0 \Rightarrow +$
 $\frac{x^2+3x+2}{x^2+2x+3}$

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

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

١٠

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

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