

۱

$$f(m) \quad f\left(\frac{m+2}{\omega}\right) \quad D_f = ?$$

$$-2 \leq m \leq 4 \implies -2 \leq \frac{m+2}{\omega} \leq 4$$

$$-12 \leq m \leq 18$$

$$-4 \leq m \leq 4$$

$$D_f = [-4, 4]$$

۲

$$f(m-2) \quad D_f = [-2, 2]$$

$$-2 \leq m \leq 2$$

$$\Downarrow$$

$$-8 \leq m-2 \leq 6$$

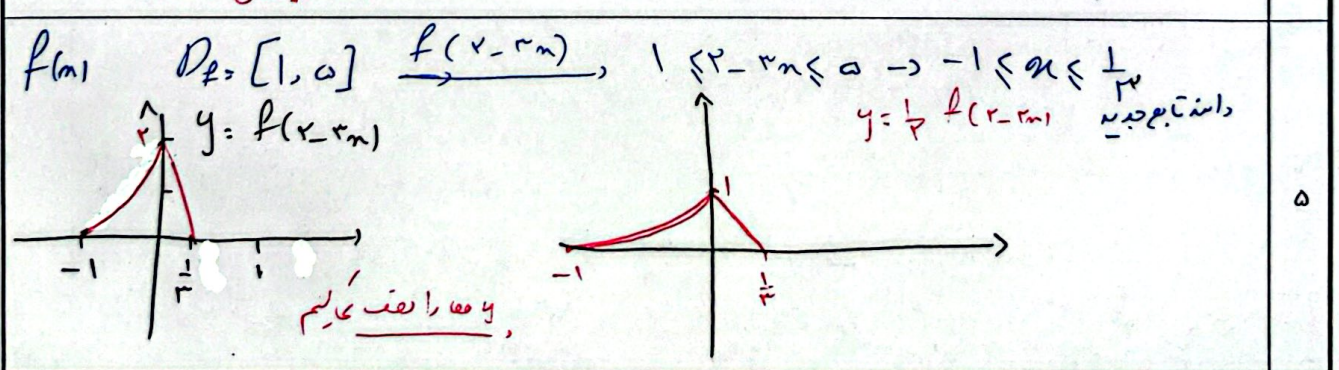
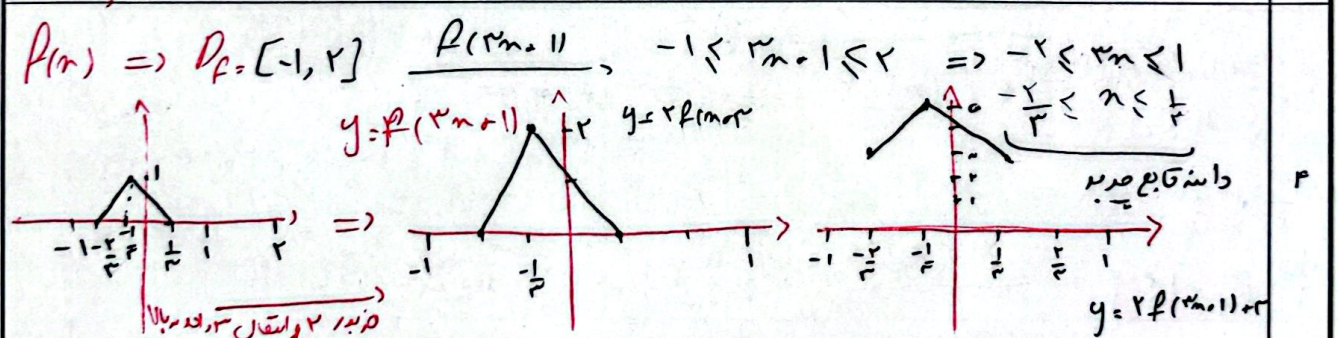
$$D_f = [-8, 6]$$

۳

$$f\left(\frac{m+1}{2}\right) \quad D_f = [-1, 2]$$

$$-1 \leq m \leq 2 \implies -1 \leq \frac{m+1}{2} \leq 2$$

$$\implies \left\{ -\frac{3}{2} \leq m \leq \frac{5}{2} \right\} \quad D_f = \left[-\frac{3}{2}, \frac{5}{2}\right]$$



$$y = -\frac{1}{x}x^2 + \frac{x}{2}x + 1 \rightarrow -\frac{1}{x}(x-\frac{x}{2})^2 + \frac{x}{2} \xrightarrow{\text{تغییر متغیر}} y = -\frac{1}{x}(x-\frac{x}{2})^2 + 3$$

با انتقاد این مقدار تبدیل کنیم

max  $\frac{-\frac{1}{x}}{-\frac{1}{x}} = \frac{x}{2}$

نات  $\frac{1}{x}$  است  
D با  $\frac{x}{2}$

$$f(x) = -\frac{1}{x}(x-\frac{x}{2})^2 + 3 = 0 \Rightarrow -\frac{1}{x}(x-\frac{x}{2})^2 = -3, x-\frac{x}{2} = 6 \Rightarrow x=12$$

$(x-\frac{x}{2})^2 = 9 \Rightarrow x-\frac{x}{2} = 3 \Rightarrow x=6$

$$f(x) = ax^2 + bx + c \Rightarrow f(x) = a(x-\alpha)(x-\beta) \quad f(1) = 4$$

$a = -1 \quad f(x) = -1(x+1)(x-3)$

$f(2x+1) = -1(2x+1)(2x-1) \Rightarrow +1 \rightarrow y = 1x^2 + 1x - 2$

$f(4x+1) = -1(4x+1)(4x-1) \xrightarrow{-2f(2x+1)+1} \text{max} \left| \begin{matrix} -\frac{1}{x} \\ -1 \\ A(-\frac{1}{x}-1) \text{ در } \alpha = \frac{1}{x} \end{matrix} \right|$

$f(x) \rightarrow D_f = [a, \infty) \rightarrow f(x+1) \rightarrow a < x+1 \leq x \quad D_f = [a+1, \infty)$

$g(x) \rightarrow D_g = [-1, b) \rightarrow g(x+1) \rightarrow -1 \leq x+1 < b \quad D_g = [-2, b-1)$

$D_f \cap D_g = (-2, \infty)$  برای اینکه  $a = -2$  و  $b = 4$  باشد

$f(\frac{x}{x+1}) = 4, D_f = [-2, \infty)$

$-1 \leq f(\frac{x}{x+1}) \leq 2 \Rightarrow -1 \leq f(x) \leq 2 \Rightarrow -2 \leq x \leq 0$

$-\frac{2}{x} \leq \frac{x}{x+1} \leq \frac{0}{x}$

$-\frac{1}{x} \leq \frac{x}{x+1} \leq \frac{1}{x}$

$f(x) \rightarrow D_g = [-\frac{1}{x}, \frac{1}{x}]$  چون در عبارت قدر مطلق است مثبت و منفی بدون آن علامت نیست

$R_f = [1, 15]$

$f(x) = \left| \frac{x-1}{x+1} \right| \xrightarrow{\text{حالت اول}} \left| \frac{(x-1)+1}{x(x-1)+1} \right| + 1 \rightarrow g(x) = \left| \frac{x-1}{x(x-1)+1} \right| + 1$

$x \cdot g(x) < 0 \rightarrow x+1 \cdot \left| \frac{x-1}{x(x-1)+1} \right| < 0$

عبارت صورتی را که در مخرج است  $x \leq -1$  باشد  $a$  با  $x$  باشد

اگر  $x < -1$   $\frac{x-1}{x(x-1)+1} < 0 \rightarrow \frac{x^2-1}{x(x-1)+1} < 0$

$I_2 = (-\infty, -1) \cup (1, \infty)$

$II. 2(-\infty, -1)$

$I \cap II = (-\infty, -1)$

$x \in (-\infty, -1)$