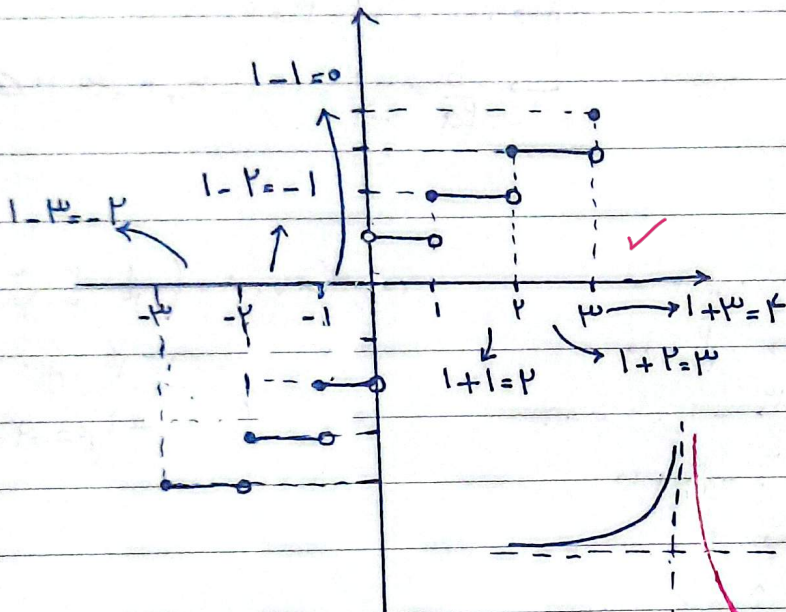


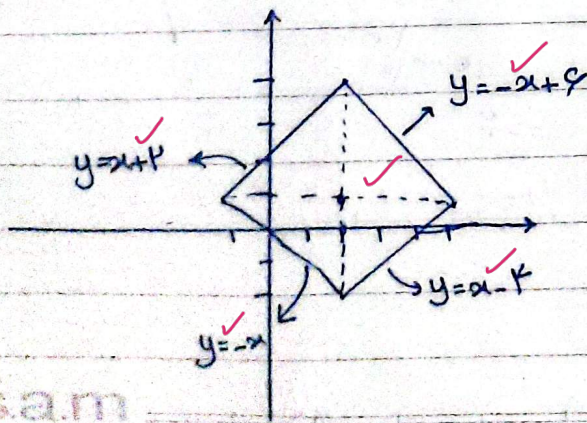
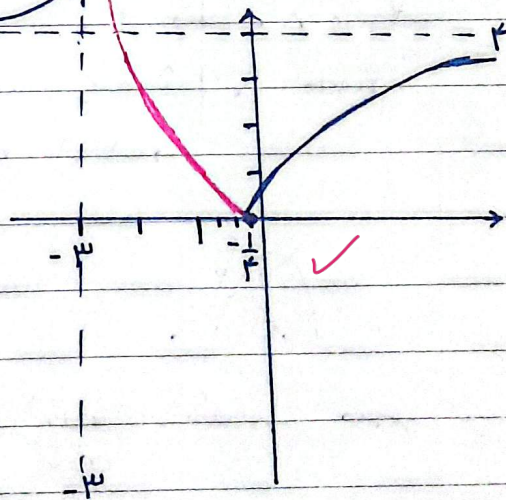
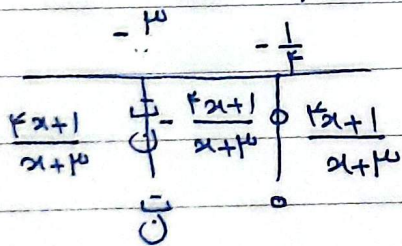
الف $\rightarrow 0 \rightarrow 0 \rightarrow 1 \rightarrow 1$ $\rightarrow 1 \rightarrow 2 \rightarrow 1$ $[1, 1] = R_f$ (۲)

ب $\rightarrow 1 \rightarrow -1$ $0 \rightarrow -2$ $-1 \rightarrow -3$ $\rightarrow [-3, -1] = R_f$



1 $\rightarrow \frac{x}{2} + 1 = 2$

2 $\rightarrow 1 + 2 = 3$



$x \geq 2$ $\left\{ \begin{array}{l} x - 2 + y - 1 = 3 \rightarrow y = -x + 6 \\ y \geq 1 \end{array} \right.$ (۲)

$x \leq 2$ $\left\{ \begin{array}{l} 2 - x + y - 1 = 3 \rightarrow y = x + 2 \\ y \geq 1 \end{array} \right.$

$x \leq 2$ $\left\{ \begin{array}{l} 2 - x + 1 - y = 3 \rightarrow y = -x \\ y \leq 1 \end{array} \right.$

$x \geq 2$ $\left\{ \begin{array}{l} x - 2 + 1 - y = 3 \rightarrow y = x - 4 \\ y \leq 1 \end{array} \right.$

الف) $x + \frac{1}{x} > 0 \rightarrow x + \frac{1}{x} \geq 2 \rightarrow$ أكثر $\rightarrow 2 + 2\sqrt{2}$ (2) . 5

$R_f = [2 + 2\sqrt{2}, +\infty)$

ب) $-(\sin x - 1)(\sin x + 1) = -\sin^2 x + \sin x + 1 \rightarrow$ $\begin{cases} -1 \rightarrow 0 \\ 1 \rightarrow -1 + 2 + 1 = 2 \\ \frac{b}{2a} = \frac{-1}{-2} = \frac{1}{2} \rightarrow -1 + 1 + 1 = 1 \end{cases}$ [0, 2] = R_f

ج) $D_f = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$ (2) . 6

1	$-\frac{1}{16} + 1 = 0$	$90 + 9 + 7 + 1 + (-\frac{1}{16} - \frac{2}{16} - \frac{3}{16} - \frac{4}{16} - \frac{5}{16} - \frac{6}{16} - \frac{7}{16} - \frac{8}{16}) = 90 - \frac{36}{16} = 90 - \frac{9}{4} = 90 - 2.25 = 87.75$
2	$-\frac{2}{16} + 1 = 0$	
3	$-1 + 1 = 0$	
4	$-\frac{4}{16} + 1 = 0$	
5	$-\frac{5}{16} + 1 = 0$	
6	$-\frac{6}{16} + 1 = 0$	
7	$-\frac{7}{16} + 1 = 0$	
8	$-\frac{8}{16} + 1 = 0$	
9	$-\frac{9}{16} + 1 = 0$	

د) (2) . 7

هـ) $ax^2 + b' = ax^2 + bx + c \rightarrow bx + c$ +

$a=0 \rightarrow bx + c = 0 \rightarrow x = -\frac{c}{b}$

$b=1 \rightarrow x = -c$

$c=-2 \rightarrow x = 2$

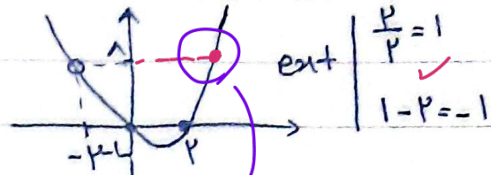
$y = \sqrt{bx + c} = \sqrt{x - 2}$

$[2, +\infty) \rightarrow [2, +\infty) = R_f$

~~$a+b=1$~~

$$\frac{x^3 - 1}{x+1} = \frac{x(x-1)(x+1)}{x+1} = x^2 - 1 \xrightarrow{x=-1} 1+1=2 \quad (1)$$

$[0, +\infty) - \{1\} = [-1, +\infty) - \{1\}$



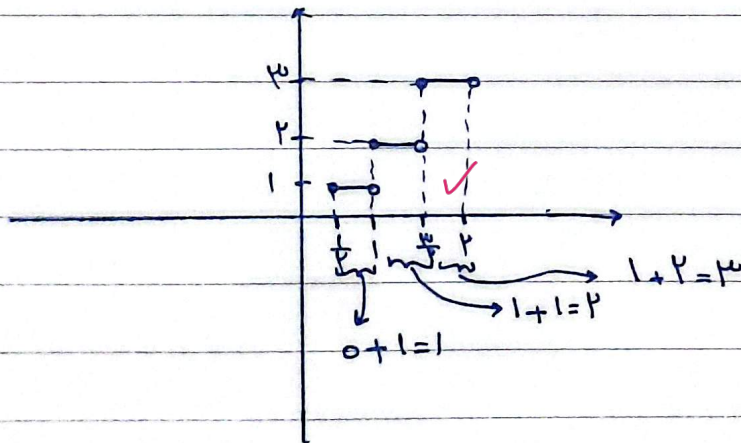
$f\left(\frac{a+b}{2}\right) = f\left(\frac{-1}{2}\right) = f\left(\frac{1}{2}\right)$

از این طرف هم باید حذف شد!

صفحه آخر...

$$x^3 + ax^2 + bx - 1 = (x-0)^3 \rightarrow (x-1)^3 = x^3 - 3x^2 + 3x - 1 \quad a = -3, b = 3 \quad (2)$$

$\left[\begin{array}{l} \sqrt[3]{(-1)^3} = -1 \\ \sqrt[3]{(1-1)^3} = 0 \end{array} \right] \rightarrow R_f = [-1, 0]$



داده شد

(2)

$$f(n) = \frac{n(n-1)(n+1)}{n+1} = n^2 - 1$$

$n^2 - 1 \neq 1 \rightarrow \begin{cases} n \neq -1 \\ n \neq 1 \end{cases}$

$n=1$ در برد تابع نیست یعنی:

$D_f = \mathbb{R} - \{-1, 1\}$ پس دافند باید است با:

$f(n) = n^2 - 1 \rightarrow \text{ext} \left| \begin{array}{l} 1 \\ -1 \end{array} \right| \Rightarrow R_f = [-1, +\infty) - \{1\}$ حالا بیایم سراغ برد:

sam $f\left(\frac{a+b}{2}\right) = f\left(\frac{1}{2}\right) = f\left(-\frac{1}{2}\right) = f(-1) = 0 \quad (3)$