

الف) $(2(\frac{x}{2}) - 2[\frac{x}{2}])^2$

$(2(\frac{x}{2} - [\frac{x}{2}]))^2 \rightarrow 0 \leq < 1$

$0 \leq < 1$

$0 \leq < 2$

ب) $\lim_{x \rightarrow 1.0} y = \sin x + \varepsilon \rightarrow y = 1.0^{\sin x + \varepsilon}$

$-1 \leq \sin x \leq 1 \quad 1.0^{\sin x} \leq y \leq 1.0^1$

$R_f = [1.0^{\sin x}, 1.0^1]$

$$\begin{array}{c|c|c|c|c|c} -1 & -2 & 2 & 1 & 1 & \\ \hline + & - & + & - & + & \end{array} \quad f(x) = f(-x) \rightarrow$$
 فقط اعداد مثبت درجه دوم
رابطه یابی

$x=0 \rightarrow \frac{2}{3}$

$x=2 \rightarrow 0$
 $x \rightarrow 1^+ \rightarrow +\infty$
 $x \rightarrow +\infty \rightarrow 1$

$R = [0, \frac{2}{3}] \cup (1, +\infty)$
 $a+b+c = 0 + \frac{2}{3} + 1 = \frac{5}{3}$

الف) $f(x) = x + \frac{1}{x} + 2\sqrt{x + \frac{1}{x}}$

ب) $(3 - \sin x)(1 + \sin x) = -\sin^2 x + 2\sin x + 3$

$\sin x = -1 \rightarrow -(1) + 2(-1) + 3 = 0$
 $\sin x = 1 \rightarrow -(1) + 2(1) + 3 = 4$

$\sin x = \frac{-b}{a} = \frac{-2}{-2} = 1$

$R = [0, 4]$

$$\begin{array}{c|c|c|c|c|c|c} x & 1 & 2 & 3 & 4 & \dots & 9 \\ \hline f(x) & \frac{10}{3} & \frac{17}{3} & \frac{28}{3} & \frac{47}{3} & \dots & \frac{82}{3} \end{array}$$

$S = (\frac{10}{3} + \frac{17}{3}) \times 9 = \frac{27}{3} \times \frac{27}{3} = 27$

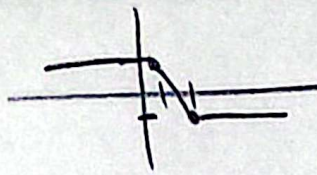
$a=0, b>0, f(2)=0 \rightarrow \sqrt{2b+C}=0 \rightarrow 2b+C=0 \rightarrow b=1, C=-2$
 $f(3)=1 \rightarrow \sqrt{3b+C}=1 \rightarrow 3b+C=1$

$g(x) = \sqrt{x^2 + 0(x) + (-2)} \rightarrow g(x) = \sqrt{x^2 - 2}$

$D_g = (-\infty, -\sqrt{2}] \cup [\sqrt{2}, +\infty)$

$$|x-2| - |x-1| = Kx$$

$$x=2 \quad x=1$$

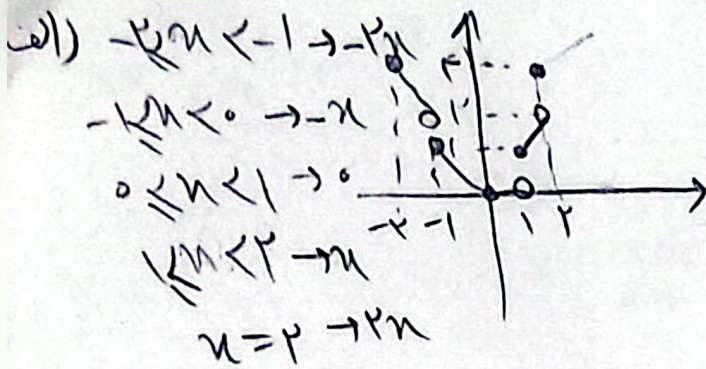


$$Kx = f(x)$$

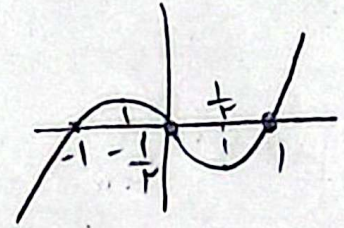
$$f(0) = 0 \rightarrow \frac{1}{x} \rightarrow K = \frac{1}{x}$$

$$f(2) = 1 \rightarrow \frac{1}{x} \rightarrow K = \frac{1}{x}$$

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ب) $x \geq 0 \rightarrow x^2 - x$
 $x < 0 \rightarrow -x^2 - x \rightarrow -(x^2 + x)$



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$$f(x) = \frac{1}{x} + \frac{1}{x+1} + \frac{1}{x^2+x} = \frac{x+1+x+1}{x(x+1)} = \frac{(x+2)}{x(x+1)} = \frac{2(x+1)}{x(x+1)} \xrightarrow{x \neq -1} \frac{2}{x}$$

$$R = \mathbb{R} - \{0, -1\} \rightarrow a+b = -1$$

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$$\frac{(\sqrt{x}-2)(\sqrt{x}-1)}{(\sqrt{x}-1)(\sqrt{x}-2)} \xrightarrow{\sqrt{x} \neq 1} \frac{\sqrt{x}-2}{\sqrt{x}-1}$$

$$\left. \begin{array}{l} \min \square = 0 \\ \max \square = +\infty \end{array} \right\} \xrightarrow{\text{مخرج و مشتق دارد}} (-\infty, 1) \cup [3, +\infty)$$

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$$\frac{(x-1)(x^2+x+2)}{(x-1)(x+1)} = \frac{(x-1)(x+1)(x+2)}{(x-1)(x+1)} \xrightarrow{x \neq \pm 1} x+2 \rightarrow R_f = \mathbb{R} - \{1, -1\}$$

نقطه

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