

الف) $|x+2x-4| \rightarrow x \geq 2 \rightarrow 2x-4$ ب) $x < 2 \rightarrow -x+4$

$R_f = [2, +\infty)$ ✓ $R_g = [-1, +\infty)$ ✓

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$x \geq 1 \Rightarrow 2x-5$ $1 \leq x < 2 \Rightarrow -x+1$ $x < 2 \Rightarrow -x+1$

$f(1) = \min \Rightarrow k = -5$ ✓

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الف) $y = x + \frac{x}{|x|} \Rightarrow x > 0 \rightarrow x+1$ ب) $y = x|x| - \frac{x}{|x|} \Rightarrow \frac{x|x|^2 - x}{|x|} = \frac{x^3 - x}{|x|}$

$x < 0 \rightarrow x-1$ $x = 0 \rightarrow 0$

$x > 0 \rightarrow x^2 - 1$ $x < 0 \rightarrow -x^2 + 1$

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الف) ✓

ب) ✓

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الف) $f(x - [x]) = \begin{cases} 0 & x = 0 \\ \frac{x}{2} & 0 < x < 2 \\ 0 & x = 2 \end{cases}$ ب) $R_f = (-1, 0]$

$x - [x + 2x] = x - [3x] = x - 3[x]$ $\Rightarrow R_g = [0, 1)$ ✓

$0(\frac{x}{2} - [\frac{x}{2}]) \Rightarrow R_f = [0, 2)$ ✓

$R_f = [0, 2)$ ✓

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$$1 \Rightarrow [\sqrt{2}, \sqrt{2}] \checkmark$$

$$0 \Rightarrow [0, \sqrt{2}] \checkmark$$

1.75

$$0 \Rightarrow [-5, 0] \checkmark$$

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$$0 \Rightarrow [-6, 0] \checkmark$$

الف) $\sin^2 x + 2 \sin x + 2$ $\xrightarrow{\max=1}$ 4 $\xrightarrow{\min=-1}$ 0 $\rightarrow -\frac{b}{2a} = -\frac{1}{2}$

ب) $\sin^2 x + 2 \sin x + 2$ $\xrightarrow{\max=1}$ 5 $\xrightarrow{\min=-1}$ 1 $\rightarrow -\frac{b}{2a} = -\frac{1}{2}$

دقت!

1.75

$$R_f = [0, 4]$$

$$R_f = [1, 5]$$

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الف) $\sin^2 x + 2 \cos^2 x \Rightarrow 1 - 2 \cos^2 x + 2 \cos^2 x = 1$

$0 < \cos^2 x < 1 \Rightarrow 0 < 2 \cos^2 x < 2$

$$1 < 2 \cos^2 x + 1 < 3 \checkmark$$

ب) $\frac{2 \cos x}{\sin x} = 2 \cot x = \sin 2x$

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1

$$R_f = [-1, 1] \checkmark$$

الف) $\sin^4 x + \cos^4 x \Rightarrow$

ب) $\frac{1}{2} \leq \sin^4 x + \cos^4 x \leq 1$

$$\frac{1}{2} \leq \sin^4 x + \cos^4 x \leq 1$$

$$R_f = \{0, 1\} \checkmark$$

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$$R_f = [\frac{1}{2}, 1] \checkmark$$

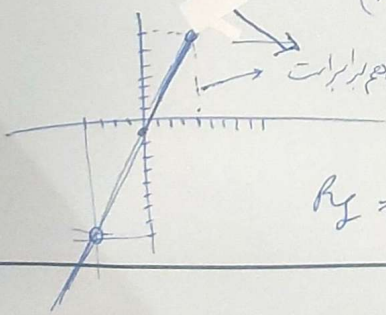
الف) $\frac{n^2 + 2n - 1}{n+2} = n - 1 + \frac{3}{n+2}$

ب) $\frac{(n+1)(n+2)}{(n+1)} = n+2$

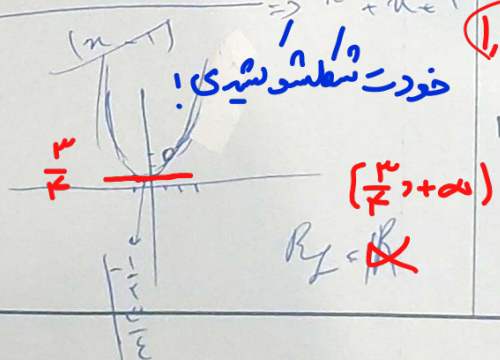
خودت شرط نشی!

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$$R_f = \mathbb{R} - \{-1\} \checkmark$$



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