

الف) $(x + \frac{x}{3}) = \theta \Rightarrow -1 \leq \sin \theta \leq 1 \Rightarrow 0 \leq \sin^2 \theta \leq 1 \Rightarrow -1 \leq 2 \sin^2 \theta - 1 \leq 1$

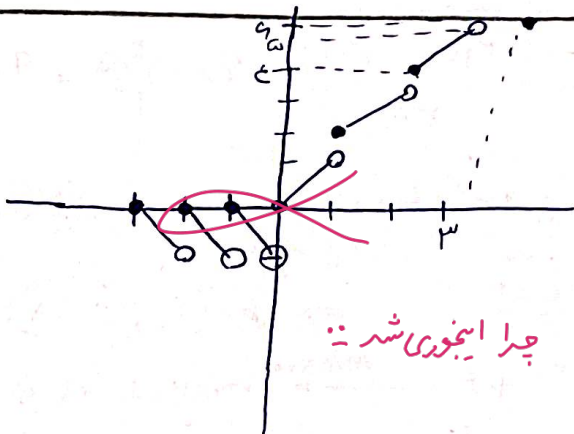
$\Rightarrow R_f = [-1, 1]$

(۲) [۱]

ب) $3 \cos^3 x - 4 \Rightarrow -1 \leq \cos^3 x \leq 1 \Rightarrow -1 \leq 3 \cos^3 x - 4 \leq -1$

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

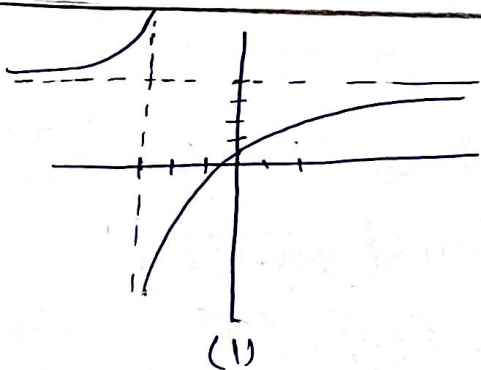
$-3 \leq x < -2$	$-x-3$
$-2 \leq x < -1$	$-x-2$
$-1 \leq x < 0$	$-x-1$
$0 \leq x < 1$	x
$1 \leq x < 2$	$x+1$
$2 \leq x < 3$	$x+2$
$x=3$	$x+3=6$



چرا اینجا می‌نویسند؟

معنی افتر...

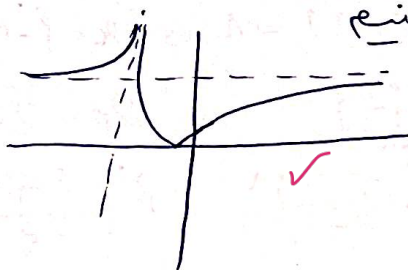
(۲)



(۱)

اول تابع همگرا نیست $\frac{4x+1}{x+3}$ را رسم می‌کنیم

حال قدرمطلق را اعمال می‌کنیم



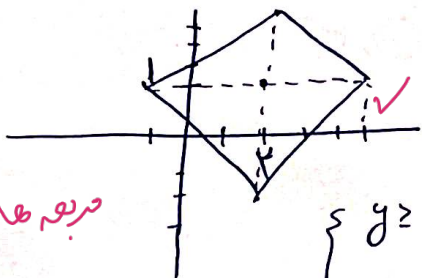
(۲) [۳]

$A \begin{vmatrix} a \\ b \end{vmatrix}$ مرکز

ضابطه: $|x-a| + |y-b| = k$ به ازای $|x-2| + |y-1| = 3$

کانونه مربع است

(۲)



مربعی ها...

حال برای ضابطه بنویس؟

$y \geq 1$	$y = 4 - (x-2)$	$\begin{cases} x \geq 2 & 4-x \\ x < 2 & x+2 \end{cases}$
$y < 1$	$y = (x-2) - 2$	$\begin{cases} x \geq 2 & x-4 \\ x < 2 & -x \end{cases}$

$$\text{الف) } \frac{n^2+1}{n} \geq 0 \rightarrow \boxed{n > 0} \xrightarrow[\text{معرّضه}]{\text{مضروب} \frac{n}{n}} n + \frac{1}{n} \geq 2 \Rightarrow [2 + \sqrt{2}, +\infty) = \mathbb{R}_f$$

$$\text{ب) } -\sin^2 + 2\sin x + 3 = y \Rightarrow \begin{cases} \sin x = -\frac{b}{2a} = \frac{-2}{-2} = 1 \rightarrow y = 4 \\ \sin x = 0 \rightarrow y = 3 \\ \sin x = -1 \rightarrow y = 2 \end{cases} \Rightarrow R_f = [2, 4]$$

$$\text{ج) مجموع اعداد } = -\frac{1}{2^0}(1) + 10 - \frac{2}{2^1} + 10 - \frac{4}{2^2} + 10 + \dots - \frac{9}{2^9} + 10 =$$

$$(9 \times 10) + \left(\frac{-(1+2+4+\dots+9)}{2^9} \right) = 90 - \frac{45}{2^9} = 90 - 10 = 80 \quad \checkmark$$

$$D_f = [2, +\infty) \Rightarrow an^2 + bn + c \Rightarrow a = 1 \rightarrow 2b + c = 0$$

$$f(1) = 1 \Rightarrow b + c = 1$$

$$\Rightarrow b = 1, c = -1$$

$$\Rightarrow g(x) = \sqrt{x^2} + \varepsilon \xrightarrow{\min x=0} \min y = \sqrt{2} = 2 \Rightarrow R_f = [2, +\infty)$$

$$\frac{x^2 - \varepsilon x}{x+2} = \frac{x(x-2)(x+2)}{x+2} = x(x-2) = 1 \Rightarrow x = \{-2, 1\}$$

$$\hookrightarrow D_f = \mathbb{R} - \{-2\}$$

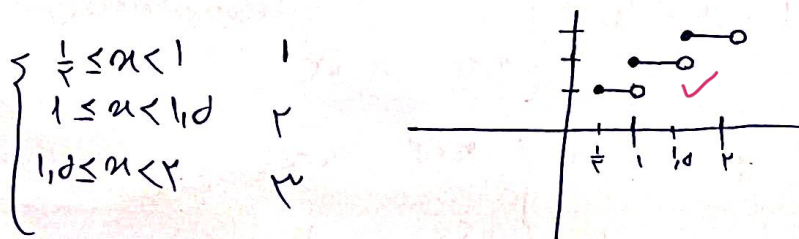
$$\hookrightarrow x^2 - 2x \xrightarrow{\text{مربع}} [-1, +\infty) \rightarrow c = -1$$

$$D_f = \mathbb{R} - \{-2, 1\} \Rightarrow a = -2, b = \varepsilon$$

$$f\left(\frac{\varepsilon-2}{-2}\right) = f(-1) = 1$$

$$\text{د) چون تابع خطی است} \Rightarrow y = \sqrt[3]{(x+1)^3} = x+1 \Rightarrow R_f = [-1, 1]$$

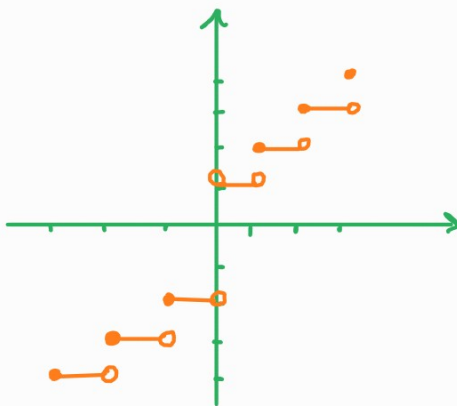
$$\hookrightarrow x^3 - 9x^2 + 12x - 1 \rightarrow \begin{cases} a = -9 \\ b = 12 \end{cases} \Rightarrow D_f = [-4, 12]$$



$$\text{ه) سه بار خود} \quad \boxed{10}$$

$$y = \begin{cases} [x] + 1 & x > 0 \\ [x] - 1 & x < 0 \end{cases}$$

$\Rightarrow$



-2