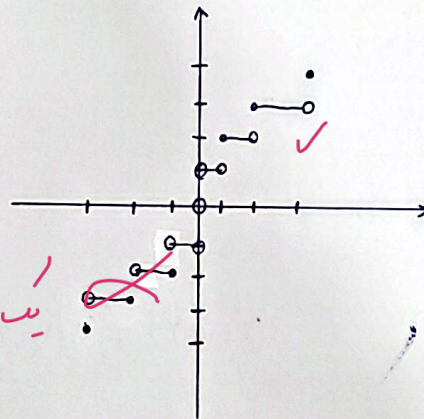


الف) $f(x) = 2 \sin^2(x + \frac{\pi}{2}) - 1$ $\begin{cases} \max \sin^2 = 1 \rightarrow 2 - 1 = 1 \\ \min \sin^2 = 0 \rightarrow 0 - 1 = -1 \end{cases} \Rightarrow R_f = [-1, 1]$ ①

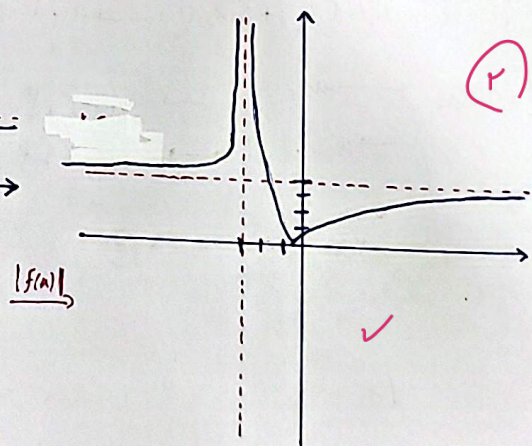
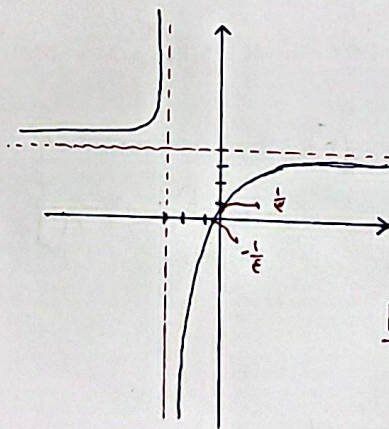
ب) $g(x) = 3 \cos^3 x - 4$ $\begin{cases} \max \cos^3 = 1 \rightarrow 3 - 4 = -1 \\ \min \cos^3 = -1 \rightarrow -3 - 4 = -7 \end{cases} \Rightarrow R_g = [-7, -1]$

$f = \frac{x}{|x|} + [x] ; x \in [-2, 3]$



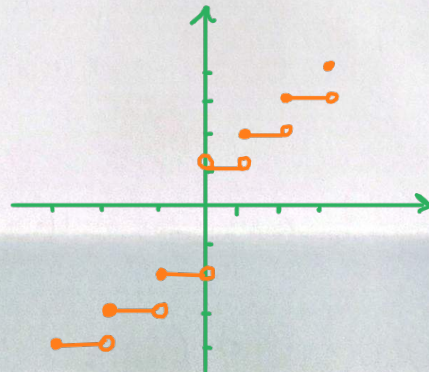
يك واحد پايين تره!

$f = \left| \frac{x+1}{x+2} \right|$



$|f(x)|$

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



2

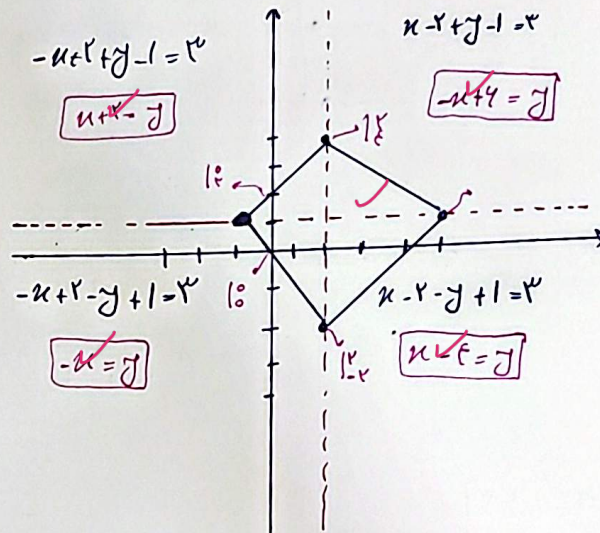
دوازدهم هر A

معین نصی

کلین کار (۶)

$$|x-2| + |y-1| = 3$$

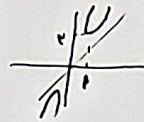
* شکل باید یک مربع به مرکز (۲، ۱) باشد
که هر اسی آن ۳ واحد از مرکز دور باشد.
آنکه کمی کج شد بخاطر واحد بنسب کلی نامناسب بود.



(۲) (۴)

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

$$x > 0$$



$$\Rightarrow \{x, +\infty\} \cup \{2\sqrt{x}, +\infty\} \rightarrow R_f = [2\sqrt{2} + 2, +\infty)$$

(۲) (۵)

$$b) y = (3 - \sin x)(1 + \sin x) \rightarrow 3 + 3\sin x - \sin x - \sin^2 x \Rightarrow -\sin^2 x + 2\sin x + 3 =$$

$$\square = \sin x \begin{cases} \text{max} = 1 \rightarrow -1 + 2 + 3 = 4 \\ \text{min} = -1 \rightarrow -1 - 2 + 3 = 0 \\ \frac{-b}{2a} = \frac{-2}{-2} = 1 \rightarrow 4 \end{cases}$$

$$\Rightarrow R_g = [0, 4]$$

$$f(n) = -\frac{1}{n^2}n + 6$$

$$n=1 \rightarrow -\frac{1}{1^2} + 6$$

$$n=2 \rightarrow -\frac{1}{2^2} + 6$$

$$n=3 \rightarrow -\frac{1}{3^2} + 6$$

⋮

$$n=9 \rightarrow -\frac{1}{9^2} + 6$$

$$D_f = \{1, 2, 3, 4, 5, \dots, 9\}$$

$$(9 \times 6) + \left(\left(-\frac{1}{1^2} + 6 \right) + \left(-\frac{1}{2^2} + 6 \right) + \left(-\frac{1}{3^2} + 6 \right) + \dots + \left(-\frac{1}{9^2} + 6 \right) \right) = 9 \times 6 - 15 = 39$$

(۲) (۶)

A

میں نئی

ترکیب کیا رہے؟

$$f(u) = \sqrt{au^2 + bu + c}$$

$$D_f = [r, +\infty)$$

$$\alpha = 0$$

آیا $f(u)$ جب «است»؟ خیر

D_f جہاں ان کا اندازہ ہے

$$\begin{array}{r} a_1 \quad a_1 \\ + \quad + \\ \hline a_1 \quad a_1 \\ - \quad - \\ \hline a \\ + \quad + \\ \hline a \\ - \quad - \\ \hline \end{array}$$

(2)

$$f(r) = 1$$

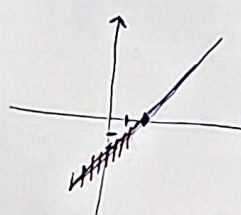
$$g(u) = \sqrt{bu^2 + au - rc}$$

$$R_g = ?$$

$$\sqrt{u^2 + 0 + \epsilon}$$

$$[r, +\infty)$$

$$[r, +\infty) = R_g$$



$$bu + c = y$$

$$u = -r \rightarrow y = 0$$

$$u = -r \rightarrow y = 0$$

$$\begin{cases} r b + c = 1 \\ r b + c = 0 \end{cases}$$

$$h = 1$$

$$c = -r$$

$$f(u) = \frac{u^2 - \epsilon u}{u + r}$$

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

$$u \neq -r$$

$$\frac{u(u-r)(u+r)}{u+r} \neq 1 \rightarrow u(u-r) \neq 1$$

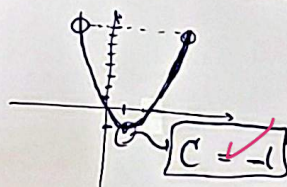
$$u \neq \epsilon$$

$$D_f = \mathbb{R} - \{a, b\}$$

$$a = -r$$

$$b = \epsilon$$

$$f\left(\frac{a+b}{rc}\right) = ?$$



$$\Rightarrow f\left(\frac{-r+\epsilon}{-r}\right) = f(-1) = \frac{-1+\epsilon}{-1+r} = \text{(2)}$$

(2) (1)

$A \sim \frac{1}{c}$

معين نفسي

كثافة L^2 ④

$$J = \sqrt{u^2 + au^2 + bu^2 - 1} \quad \text{---} \quad (u-x)^2 = u^2 - 4u^2 + 16u^2 - 1$$

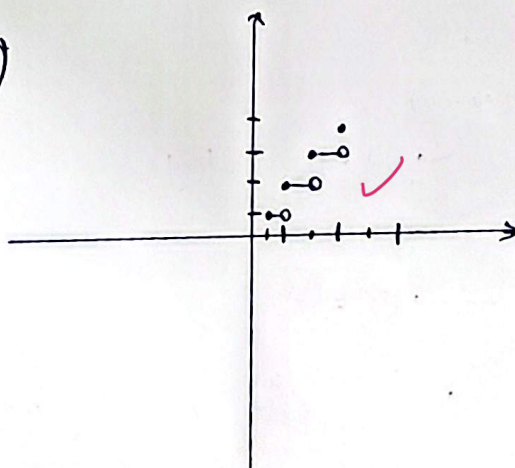
② ⑨

$$[a, b]$$

↓ ↓
-4 12

$$J = u-x \begin{pmatrix} -4 & -1 \\ 12 & 10 \end{pmatrix} \Rightarrow R_f = [-1, 10]$$

$$J = [u] + [u + \frac{1}{c}] ; u \in [\frac{1}{c}, c]$$



كثافة L^2 ③ ②