

۱۹، ۷۵

تکالیف ۲

دارند در حد A

روان در حد

الف)  $f(n) = 2 \sin^2(n + \frac{\pi}{4}) - 1$

$0 \leq \sin^2(n + \frac{\pi}{4}) \leq 1 \rightarrow -1 \leq 2 \sin^2(n + \frac{\pi}{4}) - 1 \leq 1$

$-1 \leq 2 \sin^2(n + \frac{\pi}{4}) - 1 \leq 1 \quad R_f = [-1, 1]$

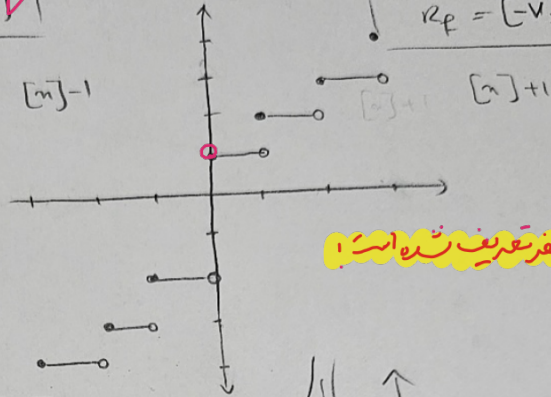
$y = \frac{n}{n} + [n] \quad R_f = [-1, 1]$

ب)  $g(n) = 3 \cos^3 n - 4$

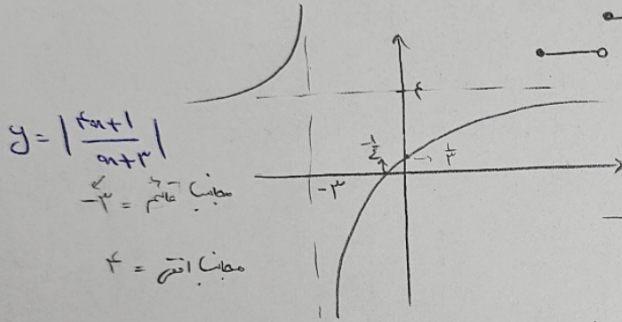
$-1 \leq \cos^3 n \leq 1$

$-3 \leq 3 \cos^3 n \leq 3 \rightarrow -7 \leq 3 \cos^3 n - 4 \leq -1$

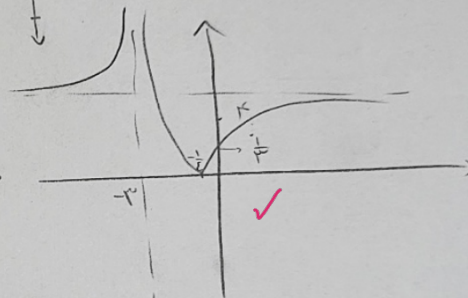
$R_g = [-7, -1]$



صفر تعریف شده است



$\frac{1}{x+3} = \frac{1}{x+3}$   
موجب است  
 $x =$  موجب است

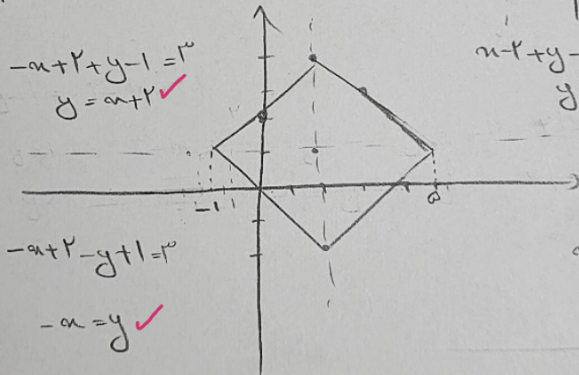


$|x-1| + |y-1| = 3$

$-x+1+y-1=3 \rightarrow y=x+3$

$-x+1-y+1=3 \rightarrow -x-y=1$

$-x=y$



$x-1+y-1=3 \rightarrow y=-x+5$

$x-1-y+1=3 \rightarrow x-y=3$

$x-y=3$

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

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

$(2, +\infty)$

$(\sqrt{2}+1)^2 - 1$

$2+1+2\sqrt{2}-1 = 2+2\sqrt{2}$

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

ب)  $y = (3 - \sin n)(1 + \sin n)$

$y = 3 + 3 \sin n - \sin n - \sin^2 n$

$y = -\sin^2 n + 3 \sin n + 3$

$\sin n = 1 \rightarrow -1 + 3 + 3 = 5$

$\sin n = -1 \rightarrow -1 - 3 + 3 = -1$

$\sin n = \frac{-b}{2a} = \frac{-3}{-2} = 1.5 \rightarrow$

$R_f = [-1, 5]$

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

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

-4

(2)

$$\left(-\frac{1}{p} + 1\right) + \left(-\frac{2}{p} + 1\right) + \left(-\frac{3}{p} + 1\right) + \dots + \left(-\frac{9}{p} + 1\right) = 9 \times 1 + \left(-\frac{1}{p}\right)(1 + 2 + \dots + 9)$$

$$9 + \left(-\frac{1}{p}\right)\left(\frac{9 \times 10}{2}\right) = \boxed{0}$$

$$f(n) = \sqrt{an^2 + bn + c}$$

$$D_f = [r, +\infty) \quad f(r) = 1$$

$$g(n) = \sqrt{bn^2 + an - c} \rightarrow R_g = ?$$

-V

(2)

$$\sqrt{bn + c}$$

$$n \geq -\frac{c}{b}$$

$$\left| -\frac{c}{b} = r \right|$$

$$-c = rb$$

$$c = -rb$$

$$\sqrt{rb + c} = 1$$

$$rb + c = 1$$

$$rb - rb = 1$$

$$b = 1$$

$$c = -1$$

$$g(n) = \sqrt{bn^2 - rc}$$

$$g(n) = \sqrt{n^2 + 1}$$

$$0 \rightarrow r$$

$$+\infty \rightarrow +\infty$$

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

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

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

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

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

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

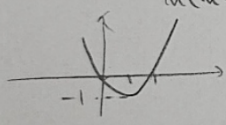
$$c = -1$$

$$\frac{n(n-1)(n+1)}{n+1}$$

$$R = \{-1, 1\}$$

$$n(n-1) = 1$$

$$\begin{aligned} n^2 - n - 1 &= 0 \\ (n-1)(n+1) &= 0 \\ n &= 1 \\ n &= -1 \end{aligned}$$



$$\Rightarrow -1\left(\frac{-1}{-1}\right) = \boxed{1}$$

-A

(2)

$$y = \sqrt{n^2 + an + b - 1}$$

$$D_f = [a, b]$$

$$R_f = ?$$

$$[-1, 1]$$

(2) -9

$$(n-r)^2 = a^2 - 4an + 11n - 1$$

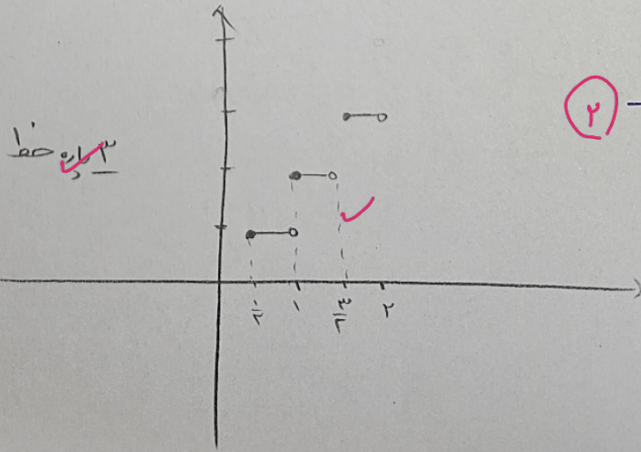
$$a = -4 \quad b = 11$$

$$y = \sqrt{(n-r)^2} = n-r$$

$$-4 \leq n \leq 11 \quad -1 \leq n-r \leq 1$$

$$y = [n] + \left[n + \frac{1}{r}\right]$$

$$D_f = \left[\frac{1}{r}, r\right)$$



(2) -10