

$g(m) = 3 \cos^2 m - 4$

$-1 \leq \cos^2 m \leq 1$

$-1 \leq 3 \cos^2 m \leq 3$

$-4 \leq 3 \cos^2 m - 4 \leq -1$

$R_g = [-4, -1]$

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

$-1 \leq \sin^2(m) \leq 1$

$0 \leq 2 \sin^2(m + \frac{\pi}{4}) \leq 2$

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

$R_f = [-1, 1]$

$y = \frac{n}{|n|} + [n] \Rightarrow f(n) = \begin{cases} 1 + [n] & 0 \leq n \leq 2 \\ -1 + [n] & -2 \leq n \leq 0 \end{cases}$

$\begin{aligned} & \leq \Rightarrow 0 \leq n < 1 \rightarrow [n] = 0 \\ & \leq \Rightarrow 1 \leq n < 2 \rightarrow [n] = 1 \\ & \leq \Rightarrow 2 \leq n < 3 \rightarrow [n] = 2 \\ & \leq \Rightarrow 3 \leq n < 4 \rightarrow [n] = 3 \\ & \leq \Rightarrow -1 \leq n < 0 \rightarrow [n] = -1 \\ & \leq \Rightarrow -2 \leq n < -1 \rightarrow [n] = -2 \\ & \leq \Rightarrow -3 \leq n < -2 \rightarrow [n] = -3 \end{aligned}$

$y = \left| \frac{n+1}{n+2} \right|$

$y' = \frac{n+1}{n+2}$

این نمودار را درون قدر مطلق رسم کنیم

$y = \left| \frac{n+1}{n+2} \right|$

$y = \frac{n+1}{n+2}$

محدوده = -3

حالت افقی = 4

قدر مطلق

روی کل عبارت

(y منفی یکسان)

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

$n < 2, y > 1 \Rightarrow n-2+y-1=3 \Rightarrow y=n+4$

$n > 2, y < 1 \Rightarrow n-2-y-1=3 \Rightarrow y=n-4$

$n < 2, y < 1 \Rightarrow -n+2-y+1=3 \Rightarrow y=-n$

$n > 2, y > 1 \Rightarrow n-2+y-1=3 \Rightarrow y=n+4$

$y = (3 - \sin m)(1 + \sin m)$

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

محدوده $\sin m = -1$ $y = 0$

محدوده $\sin m = 1$ $y = 4$

$R_y = [0, 4]$

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

نقطه را در آن نقطه مثبت

ب) $2 \cdot \frac{1}{m} \geq 2$ و $2 \cdot \frac{1}{m} \leq -2$

از راه مشتق مشتق

مقدار $-b$

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

$f(+\infty) = +\infty$

$R_f = [2 + \sqrt{2} + \frac{1}{2}, +\infty)$

$f(n) = -\frac{1}{r} n + 1$ $P_f = \{1, 2, 3, \dots, 9\}$ $\Rightarrow f(1) = 1 - \frac{1}{r} = \frac{r-1}{r}$ $f(2) = 1 - \frac{2}{r} = \frac{r-2}{r}$ $\vdots$ $f(9) = 1 - \frac{9}{r} = \frac{r-9}{r}$	$S = \frac{n}{r} (a_1 + a_n)$ $n = 9$ $a_1 = \frac{r-9}{r}$ $a_n = \frac{r-1}{r}$ $\left. \begin{array}{l} \text{مجموعه } R_f \\ \text{مجموعه } R_f \end{array} \right\}$	$S = \frac{9}{r} \left(\frac{r-9}{r} + \frac{r-1}{r} \right) = \frac{9}{r} \cdot \frac{r-5}{r} = \frac{9(r-5)}{r^2}$ $S = \frac{9(r-5)}{r^2}$ $R_f = \left\{ \frac{r-9}{r}, \frac{r-8}{r}, \dots, \frac{r-1}{r} \right\}$
$f(n) = \sqrt{an^2 + bn + c}$ $P_f = [r, +\infty)$ $\text{نقطه } a=0 \text{ به } b \text{ و } c \text{ به } n \text{ وابسته است}$	$a > 0$ $bn + c \geq 0$ $n \geq -\frac{c}{b}$ $n \geq r$ $\left. \begin{array}{l} -\frac{c}{b} = r \\ c = -rb \end{array} \right\}$	$f(n) = \sqrt{ban + c}$ $g(n) = \sqrt{an^2 + r}$ $\sqrt{0 + r} = \sqrt{r}$ $\sqrt{+\infty} = +\infty$ $R_g = [r, +\infty)$ $c = -rb$ $b \neq 1$ $f(r) = 1 \Rightarrow \sqrt{rb + c} = 1$ $rb + c = 1$ $c = -rb$ $b \neq 1$
$f(n) = \frac{n^2 - 4n}{n^2 + 2} = \frac{n(n-4)}{n^2 + 2}$ $P_f = \mathbb{R} - \{a, b\} \Rightarrow P_f = \mathbb{R} - \{r, \frac{1}{r}\}$ $R_f = (c, +\infty) - \{n\}$ $n^2 - 4n = 1$ $n^2 - 4n - 1 = 0$ $(n+2)(n-6) = 0$	$f(n) = n^2 - 4n$ $\frac{r}{1+r} = 1$ $\frac{r}{1+r} = 1 \Rightarrow r = 1+r \Rightarrow 0 = r$ $\left. \begin{array}{l} c = -1 \\ a = -2 \\ b = \frac{1}{r} \\ n = -2 \end{array} \right\} \Rightarrow f\left(\frac{a+b}{c}\right) = f\left(\frac{-2+\frac{1}{r}}{-1}\right) = f(-1)$ $f(-1) = 3$	$R_f = [-1, +\infty) - \{1\}$ $f(-1) = 3$
$y = \sqrt{n^2 + 4n^2 + bn - 1}$ $y = (n-2)$	$(n-2)^2 = 4n^2 - 4n^2 + 12n - 1$ $n^2 - 4n^2 + 12n - 1 = n^2 + 4n^2 + bn - 1$ $a = -4$ $b = 12$	$P_y = [-4, 12]$ $-4 \leq n \leq 12$ $-1 \leq n-2 \leq 10$ $D_y = [-1, 10]$
$y = [n] + [n + \frac{1}{r}]$ $\text{نقطه } x \text{ به } n \text{ وابسته است}$	$\frac{1}{r} \leq n < 1$ $1 \leq n \leq \frac{r}{r}$ $\frac{r}{r} \leq n < 2$	$[n] = 0$ $[n + \frac{1}{r}] = 1 \Rightarrow y = 1$ $[n] = 1$ $[n + \frac{1}{r}] = 1 \Rightarrow y = 2$ $[n] = 1$ $[n + \frac{1}{r}] = 2 \Rightarrow y = 3$ 