

$$y = \frac{1}{n} + \frac{1}{n+1} + \frac{1}{n+2} = \frac{2(n+1)}{n(n+1)} \xrightarrow{n \neq -1} \frac{2}{n} - 1$$

نداریم $y=0$ در $\frac{2}{n} - 1$ نداریم $y=-2$ نداریم $y=0$

$$\Rightarrow R_f = R - \{-2, 0\} \Rightarrow a+b = -2+0 = -2$$

$$\frac{(\sqrt{x}-2)(\sqrt{x}-1)}{(\sqrt{x}-1)(\sqrt{x}-1)} \xrightarrow{x \neq 1} \frac{\sqrt{x}-2}{\sqrt{x}-1}$$

$\begin{cases} \min = 2 \\ \max = 1 \end{cases}$

-9

$$R_f = (-\infty, 1) \cup [2, +\infty)$$

$$\frac{(x-1)(x+1)(x+2)}{(x-1)(x+1)} \xrightarrow{x \neq -1, 1} x+2 \Rightarrow R = R$$

-10

$$\Rightarrow R_f = R - \{1, 3\}$$

$a+b=4$

(3, 1)

۱- $y = 2(x - [x]) \quad x = t \Rightarrow y = 2(x - [x]) \Rightarrow y = 2(t - [t])$ (الف)

$2(t - [t]) \Rightarrow 0 < 2(t - [t]) < 2 \Rightarrow 0 < t - [t] < 1$ (۱.۵)

$R_f = [0, 2)$ $R = [0, 1)$ $0 < t - [t] < 1$

ب) $y = \sin x + \varepsilon \quad -1 < \sin x < 1 \Rightarrow 3 < y < 5$

$\Rightarrow 1.5 < y < 1.5 \Rightarrow R_f = [1.5, 1.5]$

۲- $R_f = [0, 1) \cup (1, 2) \cup (2, 3) \cup (3, 4) \cup (4, 5) \cup (5, 6) \cup (6, 7) \cup (7, 8) \cup (8, 9) \cup (9, 10) \cup (10, 11) \cup (11, 12) \cup (12, 13) \cup (13, 14) \cup (14, 15) \cup (15, 16) \cup (16, 17) \cup (17, 18) \cup (18, 19) \cup (19, 20) \cup (20, 21) \cup (21, 22) \cup (22, 23) \cup (23, 24) \cup (24, 25) \cup (25, 26) \cup (26, 27) \cup (27, 28) \cup (28, 29) \cup (29, 30) \cup (30, 31) \cup (31, 32) \cup (32, 33) \cup (33, 34) \cup (34, 35) \cup (35, 36) \cup (36, 37) \cup (37, 38) \cup (38, 39) \cup (39, 40) \cup (40, 41) \cup (41, 42) \cup (42, 43) \cup (43, 44) \cup (44, 45) \cup (45, 46) \cup (46, 47) \cup (47, 48) \cup (48, 49) \cup (49, 50) \cup (50, 51) \cup (51, 52) \cup (52, 53) \cup (53, 54) \cup (54, 55) \cup (55, 56) \cup (56, 57) \cup (57, 58) \cup (58, 59) \cup (59, 60) \cup (60, 61) \cup (61, 62) \cup (62, 63) \cup (63, 64) \cup (64, 65) \cup (65, 66) \cup (66, 67) \cup (67, 68) \cup (68, 69) \cup (69, 70) \cup (70, 71) \cup (71, 72) \cup (72, 73) \cup (73, 74) \cup (74, 75) \cup (75, 76) \cup (76, 77) \cup (77, 78) \cup (78, 79) \cup (79, 80) \cup (80, 81) \cup (81, 82) \cup (82, 83) \cup (83, 84) \cup (84, 85) \cup (85, 86) \cup (86, 87) \cup (87, 88) \cup (88, 89) \cup (89, 90) \cup (90, 91) \cup (91, 92) \cup (92, 93) \cup (93, 94) \cup (94, 95) \cup (95, 96) \cup (96, 97) \cup (97, 98) \cup (98, 99) \cup (99, 100)$ (۱.۷۵)

$\Rightarrow R = [0, 1) \cup (1, 2) \cup (2, 3) \cup (3, 4) \cup (4, 5) \cup (5, 6) \cup (6, 7) \cup (7, 8) \cup (8, 9) \cup (9, 10) \cup (10, 11) \cup (11, 12) \cup (12, 13) \cup (13, 14) \cup (14, 15) \cup (15, 16) \cup (16, 17) \cup (17, 18) \cup (18, 19) \cup (19, 20) \cup (20, 21) \cup (21, 22) \cup (22, 23) \cup (23, 24) \cup (24, 25) \cup (25, 26) \cup (26, 27) \cup (27, 28) \cup (28, 29) \cup (29, 30) \cup (30, 31) \cup (31, 32) \cup (32, 33) \cup (33, 34) \cup (34, 35) \cup (35, 36) \cup (36, 37) \cup (37, 38) \cup (38, 39) \cup (39, 40) \cup (40, 41) \cup (41, 42) \cup (42, 43) \cup (43, 44) \cup (44, 45) \cup (45, 46) \cup (46, 47) \cup (47, 48) \cup (48, 49) \cup (49, 50) \cup (50, 51) \cup (51, 52) \cup (52, 53) \cup (53, 54) \cup (54, 55) \cup (55, 56) \cup (56, 57) \cup (57, 58) \cup (58, 59) \cup (59, 60) \cup (60, 61) \cup (61, 62) \cup (62, 63) \cup (63, 64) \cup (64, 65) \cup (65, 66) \cup (66, 67) \cup (67, 68) \cup (68, 69) \cup (69, 70) \cup (70, 71) \cup (71, 72) \cup (72, 73) \cup (73, 74) \cup (74, 75) \cup (75, 76) \cup (76, 77) \cup (77, 78) \cup (78, 79) \cup (79, 80) \cup (80, 81) \cup (81, 82) \cup (82, 83) \cup (83, 84) \cup (84, 85) \cup (85, 86) \cup (86, 87) \cup (87, 88) \cup (88, 89) \cup (89, 90) \cup (90, 91) \cup (91, 92) \cup (92, 93) \cup (93, 94) \cup (94, 95) \cup (95, 96) \cup (96, 97) \cup (97, 98) \cup (98, 99) \cup (99, 100)$

$a + b + c = \frac{a}{p}$

۳- $t > 0 \Rightarrow R = [2, +\infty)$ $t < 0 \Rightarrow R = (-\infty, -2]$ (۱)

$\Rightarrow x > 0 \Rightarrow x + \sqrt{x} = [2, +\infty) \Rightarrow t + \sqrt{t} = x + \sqrt{x} \Rightarrow R = [2 + 2\sqrt{2}, +\infty)$

$-\sin^2 x + 2\sin x + 3$ $\sin x = 1 \Rightarrow y = 4$ $\sin x = -1 \Rightarrow y = 0$

$\Rightarrow R = [-1, -1]$ $R_f = [0, 1]$

۱۴۰۱ • ۲۰۲۲

$$R = \{r_1, r_2, r_3, \dots, r_n\}$$

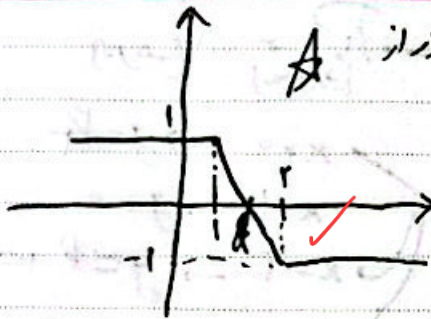
۵ - ۴

$$\text{مجموعه } R = \frac{(r_1 + r_2)}{r} \times 2 = 10 \checkmark$$

$$\text{از } a=0 \checkmark \quad \left\{ \begin{array}{l} \sqrt{r_1 b + c} = 0 \\ \sqrt{r_2 b + c} = 1 \end{array} \right\} \Rightarrow b=1, c=-1 \checkmark \quad ۵ - ۵$$

$$g(x) = \sqrt{x^2 + 2} \quad -4(x^2 - 2) \Rightarrow \sqrt{x^2 + 2} \rightarrow R_g = [1, +\infty) \checkmark$$

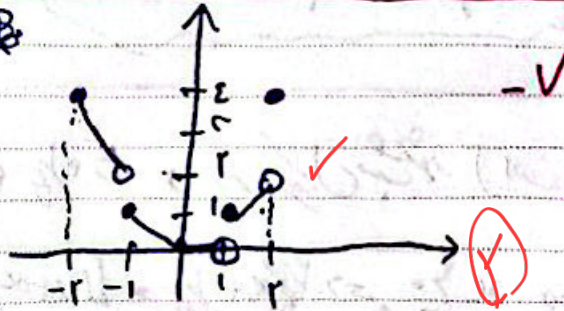
۱۴۰۱



۹ از $(r_1 - 1)$ بزرگتر و خطی است و بر کمانها
نمود
 $k_n \Rightarrow r_k = -1 \Rightarrow k = -\frac{1}{r} \checkmark$

الف) $-2 < x < -1 \rightarrow -2x \rightarrow \textcircled{A}$
 $-1 < x < 0 \rightarrow -x \rightarrow$
 $0 < x < 1 \rightarrow 0 \checkmark$
 $1 < x < 2 \rightarrow x \rightarrow$
 $x=2 \rightarrow 2x \rightarrow$

$$R = [0, 2] - \{1\} \checkmark$$



ب) $-2 < x < 0 \rightarrow -x^2 - x$
 $0 < x < 2 \rightarrow x^2 - x \checkmark$

$$R_f = [-1, 2] \checkmark$$

