

۱) $y = (x - 2[\frac{x}{r}])^r \rightarrow (r(\frac{x}{r} - [\frac{x}{r}]))^r$
 $0 \leq r(\frac{x}{r} - [\frac{x}{r}])^r < r \quad R_f = [0, r)$

۲) $\log y = \sin n, \epsilon \rightarrow y = 1$
 $R_f = \{1, 1, 1\}$ ✓

$f(x) = \sqrt{\frac{ax^2 + b}{cx^2 + d}} \rightarrow \text{می} \frac{ax^2 + b}{cx^2 + d}$

۵) $\square \rightarrow \begin{cases} \infty \rightarrow \frac{1}{a} \\ 0 \rightarrow \frac{b}{d} \end{cases} \quad R_f = (-\infty, \frac{1}{a}] \cup (1, +\infty)$
 $R_f = [0, \frac{b}{d}] \cup (1, +\infty)$
 $a + b + c = \frac{d}{p}$

۱) $f(x) = \sqrt{x + \frac{1}{x}} + 1 \rightarrow (x + \frac{1}{x})^{\frac{1}{2}} = x^{\frac{1}{2}} + \frac{1}{x^{\frac{1}{2}}} \rightarrow R_f = [x + \frac{1}{x}, +\infty)$
 $R_f = [x + \frac{1}{x}, +\infty)$

۱) $f(x) = -\sin x + 2\sin x + 2 \rightarrow \begin{cases} \sin x = 1 \rightarrow 3 \\ \sin x = -1 \rightarrow 1 \\ -\frac{b}{a} = 1 \end{cases} \rightarrow R_f = [1, 3]$ ✓

$x = -\frac{1}{c}a + 1 \rightarrow R_f = \{1, r, c, -1\}$

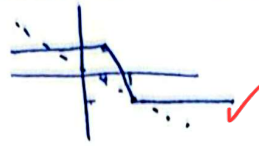
۱) $(1, \frac{1}{c}) \quad (1, \frac{1}{c}) \quad (1, \frac{1}{c})$
 $(2, \frac{1}{c}) \quad (5, \frac{1}{c}) \quad (18, \frac{1}{c})$
 $(5, \frac{1}{c}) \quad (9, \frac{1}{c}) \quad (4, \frac{1}{c})$
 $R_f = \{\frac{1}{c}, \frac{1}{c}, \dots, \frac{1}{c}\}$
 $S_n = \frac{a}{r}(a_1 + a_n) \quad S = \sqrt{a}$

$f(x) = \sqrt{ax^2 + bx + c} \rightarrow y \rightarrow a = \checkmark, b + c = n \rightarrow c = -b$

$f(x) = 1 \rightarrow r^b - r^b = 1 \rightarrow b = 1, c = -r$ ✓

$\rightarrow g(n) = \sqrt{n^2 + c} \rightarrow R_{fg} = [r, +\infty)$ ✓

$$y = |x-1| - |x-1|$$

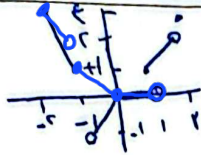


$$x > 1 \rightarrow y = 0$$

$$x < 1 \rightarrow y = -1/r$$

(2)

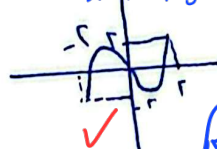
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$$\begin{aligned} -1 \leq x < -1 &\rightarrow y = -x \\ -1 \leq x < 0 &\rightarrow y = -1 \\ 0 \leq x < 1 &\rightarrow y = 0 \\ 1 \leq x < 2 &\rightarrow y = x \\ x = 2 &\rightarrow y = 1 \end{aligned}$$

$$R_f = [0, 1] - \{1\}$$

$$\begin{cases} x_1: x-1 \\ x_2: -x-1 \end{cases}$$



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

(3)

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

$$D_f = \mathbb{R} - \{0, -1\}$$

$$R_f = \mathbb{R} - \{-1, 0\}$$

$$a+b = -1$$

(4)

$$\frac{(\sqrt{x}-1)(\sqrt{x}-1)}{(\sqrt{x}-1)^2} = \frac{\sqrt{x}-1}{\sqrt{x}-1} \checkmark \quad x \geq 1 \quad R_f = [1, +\infty)$$

(5)

$$f(x) = \frac{(x-1)(x+1)(x+1)}{(x-1)(x+1)} \xrightarrow{x \neq \pm 1} f(x) = x+1$$

$$D_f = \mathbb{R} - \{\pm 1\}$$

$$R_f = \mathbb{R} - \{1, 2\}$$

$$a+b = 1$$

(6)