

$\frac{a+b}{c} = 0 \rightarrow \frac{0+2}{-1} = -2$ 1, 1, 5 2

$a=0, b=2, c=-1$ دسته ۱

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

$g(x) = \sqrt{x-1}\sqrt{x-2}$

$f(x)+g(x) = a+b\sqrt{x+c}$

$f+g = \sqrt{1(x-2)} = 2\sqrt{x-1} \Rightarrow x^2 - 14x + 42$

$(f+g)^2 \rightarrow f^2 + g^2 + 2fg$ 1

$fg = 2 \sqrt{(x+2)(x-2)} = 2 \sqrt{x^2-4}$

$f(x) = \frac{x+2}{x^2-2x+3}$

$g(x) = \{(2, 1), (1, 0), (3, 0), (0, 2)\} \rightarrow x=2 \rightarrow g(2)=1$

$f(2) = \frac{4}{-1} = -4$ $\frac{g(2)}{f(2)} = -\frac{1}{4}$ 2

$\frac{g}{f} \rightarrow \{(2, -\frac{1}{4}), (0, 4)\} \rightarrow x=0 \rightarrow g(0)=2 \rightarrow f(0) = \frac{2}{3}$

$f(x) = \{(1, 2), (2, -1), (2, 1), (-1, 4)\}$ 3

$g(x) = \{(-2, 3), (1, -1), (3, 2), (-1, 0)\}$ 1, 2

⑦ $f(2x) \rightarrow \{(-\frac{1}{2}, 2), (\frac{3}{2}, -1), (2, 2), (-\frac{1}{2}, 4)\}$

② $f(x^2) \rightarrow \{(-2, 2), (-1, 2), (1, 2), (2, 2), (-2, 2)\}$

③ $fg^2(x) + 1 \rightarrow \{(-2, 19), (1, 13), (2, 9), (-1, 1)\}$

④ $\frac{fg}{f} \rightarrow \{(1, -2), (3, -1)\}$

$$2P = (192) \circ (392) \circ (8911) \circ (-290)$$

$$g(x)$$

کستی سبز علی

$$f(x) = \{(191) \circ (391) \circ (899) \circ (-290)\}$$

(4)

$$g(x) = \{(991) \circ (293) \circ (-294) \circ (-192) \circ (393)\}$$

$$h = 2f + g \rightarrow \{(199) \circ (399) \circ (-294)\}$$

(5)

$$f(x)$$

$$x^3 - 3x^2 + 3x \rightarrow x^3 - 3x^2 + 3x - x^3 \rightarrow \sqrt{3}x - x^3$$

(5)

$$g(x) + x$$

$$\sqrt{3}x^3 - x \rightarrow 3x - x^3 \rightarrow x(-x^2 + 3)$$

$$g(x) \rightarrow [x] + [-x] \rightarrow \frac{1}{2} x^3$$

$$g(x) \rightarrow g(x) = -1 \rightarrow g+1=0$$

$$R.f = \{(191) \circ (393)\}$$

(6)

$$f(x) = \sqrt{9x - x^3}$$

$$g(x) = \{(193) \circ (294) \circ (894) \circ (991)\}$$

$$x=2 \rightarrow \sqrt{10-8-8} = \sqrt{2} \rightarrow h(2) = \frac{\sqrt{2}}{2} \rightarrow x=9 \rightarrow \sqrt{2 \cdot 9 - 81} = \sqrt{-69}$$

$$h(x) = \frac{f(x)}{x(x^2 - 3x + 3)} = \{(191) \circ (29 \frac{\sqrt{2}}{2}) \circ (-890)\}$$

(7)

$$y = x^3 - 3x^2 + 3x$$

$$R.f = IR$$

برتاب باید به روش اصلی بدست آید

(1,25)

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

$$y = \frac{1}{x^2 + 2x}$$

$$\frac{1}{y} + 1 \rightarrow \frac{1}{y} + 1$$

$$R.f = \{(991) \circ (294) \circ (894) \circ (991)\}$$

الف) $y = n^3 - 2n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1$ (✓)

$y-1 = (n-1)^3 \rightarrow \sqrt[3]{y-1} = n-1 \rightarrow n = \sqrt[3]{y-1} + 1$

$df = 1R$

ب) $y = \frac{1}{n^2 - 2n} \rightarrow n^2 y - 2ny = 1 \rightarrow n^2 y - 2ny - 1 = 0$

$y \neq 0 \rightarrow n = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow 4y(y+1) \geq 0 \rightarrow \frac{-1}{+} \frac{0}{+}$

$y = 0 \rightarrow 0 = 1 \times$ صحتی وجود ندارد! $\rightarrow df = (-\infty, -1] \cup (0, +\infty)$

$y = x^2 - 8x + 10 \rightarrow \begin{cases} \frac{-b}{2a} \rightarrow \frac{8}{2} = 4 \\ y = 16 - 10 = 6 \end{cases}$ (1)

$Rf = [4, 6]$

$y = -x^2 + 4x + 13 \rightarrow \begin{cases} \frac{-b}{2a} \rightarrow \frac{-4}{-2} = 2 \\ -9 + 16 + 13 = 10 \end{cases}$

$Rf = (-\infty, 10]$

$y = \sqrt{x^2 - 8x - 13} \rightarrow \begin{cases} \frac{-b}{2a} \rightarrow \frac{8}{2} = 4 \\ y = 16 - 13 = 3 \end{cases}$

$Rf = \sqrt{[4, 3]}$
 $[0, +\infty)$

$y = \sqrt{4x - x^2} \rightarrow \sqrt{-x^2 + 4x} \rightarrow \begin{cases} \frac{-b}{2a} \rightarrow \frac{-4}{-2} = 2 \\ -9 + 16 = 7 \end{cases}$

$\sqrt{[-2, 2]} \rightarrow Rf$

$[0, 2]$

$$y = x^4 - 2x^2 + 1 \rightarrow \text{RF} = \mathbb{R} \quad (9)$$

$$y = x^4 - 4x^2 + 1 \rightarrow \text{RF} = \mathbb{R}$$

$$y = \sqrt{x^4 - 4x^2 + 1} \rightarrow \text{RF} = [0, \infty)$$

$$y = (x^4 - 4x^2 + 1)^2 \rightarrow [0, \infty)$$

$$y = \frac{3x+1}{x-2} \rightarrow \text{RF} = \mathbb{R} - \{2\} \quad (10)$$

$$y = \frac{2x+1}{x+1} \rightarrow \text{RF} = \mathbb{R} - \{-1\}$$

(11) $f(x) = \left\{ \left(\frac{1}{2}, 2\right), \left(\frac{5}{2}, -1\right), (2, 2), \left(-\frac{1}{2}, 4\right) \right\}$ x های f باید تغییر ندهند!

همه x های f برابر x^2 قرار می‌دهیم!

$$f(x^2) = \left\{ (1, 2), (-1, 2), (\sqrt{2}, -1), (-\sqrt{2}, -1), (2, 2), (-2, 2) \right\}$$

این عمل روی y های و اعمال می‌شود:

$$f(g(x)+1) = \left\{ (-2, 1), (1, 3), (3, 9), (-1, 1) \right\}$$

$$\frac{f}{g} = \left\{ \left(1, \frac{2 \times 2}{1}\right), \left(2, \frac{2 \times 2}{4}\right), \left(-1, \frac{2 \times 4}{1}\right) \right\} = \left\{ (1, 4), (2, 1), (-1, 8) \right\}$$