



یا زریح (مترینصفت)

سینا قراخی
AUS
آزین

①

$$f(x) = \sqrt{x+1} \sqrt{x-4} \xrightarrow{-4+4} \sqrt{(x-4)+4} \sqrt{x-4+4} = \sqrt{(\sqrt{x-4}+2)^2} \sqrt{x-4+4}$$

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

$$f(x) + g(x) = \sqrt{x-4} + \sqrt{x-4} = 2\sqrt{x-4} = a + b\sqrt{ac}$$

$$\frac{0+2}{-4} = -\frac{1}{2}$$

②

$$f(x) = \frac{x+2}{x^2-4x+3} = \frac{x+2}{(x-1)(x-3)} \quad D = \mathbb{R} - \{1, 3\}$$

$$x \leq 3 \quad x \geq 1$$

$$g(x) = \left\{ (2, 1), (1, 0), (3, 0), (0, 4) \right\}$$

$$\frac{g}{f} = \left\{ (2, \frac{1}{-4}), (0, \frac{4}{-4}) \right\}$$

③

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

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

$$a) f(2x) = \left\{ (\frac{1}{2}, 2), (\frac{3}{2}, -1), (2, 2), (-\frac{1}{2}, 4) \right\}$$

$$b) f(x^2) = \left\{ (1, 2), (\sqrt{3}, -1), (2, 2), (-2, 2) \right\}$$

$$c) 2g^2(x) + 1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\}$$

$$d) \frac{f}{g} = D \cap Dg - \{x | g(x) = 0\} = \left\{ (1, -4), (3, -1) \right\}$$

(e) $f(x) = \{(1,1), (2,1), (3,9), (-1,0)\}$ $g(x) = \{(1,1), (2,3), (-1,4), (-1,2), (3,3)\}$

$h = 2f + g$

$h = \{(1,3), (2,5), (-1,9)\}$

$f(x) = \frac{\sqrt{4x-x}}{x-2}$

$g(x) = [x] + [-x] \quad x \in \mathbb{Z} \rightarrow 0$
 $x \notin \mathbb{Z} \rightarrow -1$

$\left(\frac{f}{g+1}\right)(x) = D(f \cap Dg - \{x \mid g(x) = 0\}) = \{0, 1, 2\}$

$\sqrt{4x-x} \geq 0 \Rightarrow \sqrt{4x-x} \geq x$
 $4x-x \geq x^2$
 $3x-x^2 \leq 0$

$x(x-3) \leq 0 \Rightarrow x \in [0, 3] - \{2\}$

(a) $f(x) = \sqrt{-x^2 + 6x - 8} = \sqrt{-(x^2 - 6x + 8)} = \sqrt{-(x-1)(x-4)}$

$g(x) = \{(1,3), (2,4), (3,5), (4,1)\}$

$\frac{1}{-1+1-1}$

$x=1 \quad x=4$
 $[1, 4]$

$h(x) = \frac{f(x)}{g(x)} \rightarrow D(f \cap Dg - \{x \mid g(x) = 0\}) = \{1, 2, 3\}$

$-\frac{4+1-4}{\sqrt{2}}$

$h(x) = \{(1, \frac{3}{3}), (2, \frac{4}{4}), (3, \frac{5}{5})\}$

$\sqrt{2}$

$$1) y = \frac{x^3 - 3x^2 + 3x - 1 + 1}{x}$$

$$(x-1)^3 + 1 = y$$

$$(x-1)^3 = y-1$$

$$x-1 = \sqrt[3]{y-1} \quad x = \sqrt[3]{y-1} + 1 \quad R = \mathbb{R}$$

(1, 45)

$$2) y = \frac{1}{x^2 - 2x}$$

بعض 40 عبات درج 2 بعض شهادت!

$$R_f = (-\infty, -1]$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y = -1$$

$$U = (0, +\infty)$$

$$y = \frac{t+1}{t}$$

$$(x^2 - 2x)(y) \leq 1 \rightarrow x^2 - 2x = \frac{1}{y} \rightarrow x^2 - 2x - \frac{1}{y} = 0$$

$$\Delta = 4 + \frac{4}{y}$$

$$y > 0$$

(1)

$$3) y = x^2 - 4x + 1 \quad \alpha > 0 \quad \Delta = 16 - 4 = 12 < 0 \quad U$$

$$\text{ent} \left| \frac{-b}{2a} \right|$$

$$\frac{-\Delta}{4a} = \frac{12}{4} = 3$$

$$R_f = [3, +\infty)$$

$$4) y = x^2 + 9x + 2 \quad \alpha < 0 \quad \Delta = 81 + 4 = 85 > 0 \quad A$$

$$\text{ent} \left| \frac{-b}{2a} \right|$$

$$\frac{-\Delta}{4a} = \frac{-85}{4} = -21.25$$

$$R_f = (-\infty, 21.25]$$

$$5) y = \sqrt{x^2 - 4x - 2} \quad \alpha > 0 \quad \Delta = 16 + 8 = 24 > 0 \quad V$$

$$\text{ent} \left| \frac{-b}{2a} \right|$$

$$\frac{-\Delta}{4a} = \frac{-24}{4} = -6$$

$$R_f = [-6, +\infty) \Rightarrow R_f = [0, +\infty)$$

$$6) y = \sqrt{4x - x^2} \quad \alpha < 0 \quad \Delta = 16 > 0 \quad A$$

$$\Delta = 16 > 0$$

$$A$$

D

$$\text{ent} \left| \frac{-b}{2a} \right|$$

$$\frac{-\Delta}{4a} = \frac{-16}{4} = -4$$

$$R_f = (-\infty, 4) \Rightarrow R_f = [0, 4]$$

الف) $y = x^3 - 3x^2 + 2x + 1$ $Rf = \mathbb{R}$

ب) $y = x^3 - 4x^2 + 3x + 2$ $Rf = \mathbb{R}$

ج) $y = \sqrt{x^3 - 4x^2 + 3x + 1} \Rightarrow Rf = \mathbb{R} \Rightarrow Rf = [0, \infty)$

د) $y = (x^3 - 4x^2 + 3x + 1)^2 \Rightarrow (Rf = \mathbb{R}) \rightarrow Rf = [0, \infty)$

الف) $y = \frac{x^3 + 1}{x - 2}$

$x = 2$
 $y = 2$

$2 - 1 < 0$

$Rf = \mathbb{R} - \{2\}$

ب) $y = \frac{x^3 + 1}{x + 1}$

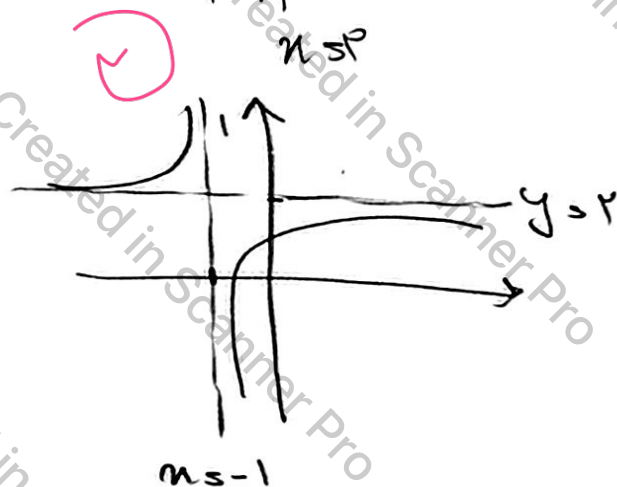
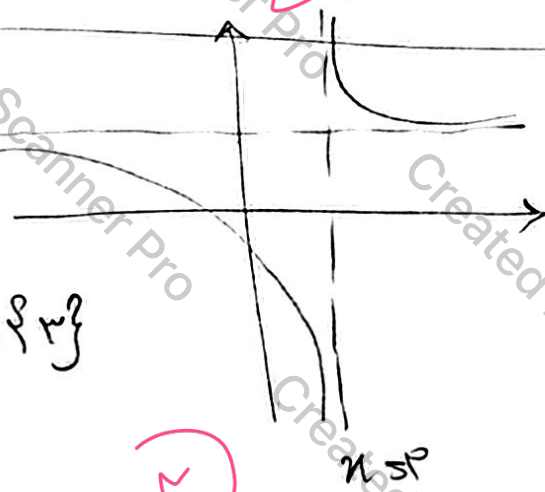
$x = -1$

$y = 2$

$2 - 1 > 0$

$Rf = \mathbb{R} - \{2\}$

آئینہ بسو حیدری



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

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

$R_f = \mathbb{R}$

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

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

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