

۱۹۱۵ ترمین به به

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$$f(x) = \sqrt{x+4\sqrt{x-4}} \quad (f+g)^2 = (x+4\sqrt{x-4} + x-4\sqrt{x-4})^2 = 4x+4x-16 = 8x-16$$

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

$$f(x)+g(x) = a+b\sqrt{x+c} \quad 2fg = 2\sqrt{(x+4\sqrt{x-4})(x-4\sqrt{x-4})} = 2\sqrt{(x-16)} = 2\sqrt{x-16}$$

$$\frac{a+b}{c} = \frac{0+2}{-4} \Rightarrow \frac{a+b}{-4} = -\frac{1}{2} \Rightarrow a+b = 2$$

$$f+g = \sqrt{4(x-4)} = 2\sqrt{x-4} \Rightarrow a=0 \quad b=2 \quad c=-4$$

$$f(x) = \frac{x+2}{x^2-6x+2} \Rightarrow (x-1)(x-19) = x^2 - 20x + 19$$

$$g(x) = \{(x,1), (1,0), (2,4), (0,5)\} \quad x=2 \Rightarrow g(2)=1 \quad f(2) = \frac{4}{-10} = -\frac{2}{5} \quad \frac{g(2)}{f(2)} = \frac{1}{-\frac{2}{5}} = -\frac{5}{2}$$

$$\frac{g}{f} = 2 \Rightarrow \{(2, -\frac{1}{2}), (0, 6)\} \quad x=0 \Rightarrow g(0)=4 \quad f(0) = \frac{2}{2} = 1 \quad \frac{g(0)}{f(0)} = \frac{4}{1} = 4$$

$$f(x) = \{(1,2), (5,2), (-1,4)\} \quad \text{الف) } f(2x) = \{(\frac{1}{2}, 2), (\frac{5}{2}, 2), (-\frac{1}{2}, 4)\}$$

$$g(x) = \{(-2,3), (1,1), (2,4), (-5,0)\} \quad \text{ب) } f(g(x)) = \{(2,3), (-1,1), (1,2), (-2,2)\}$$

$$\text{ج) } 2g^2(x)+1 = \{(-2,19), (1,3), (2,9), (-1,1)\} \quad x^2=3 \rightarrow x=\sqrt{3}$$

$$\text{د) } \frac{f}{g} = \{(-\frac{1}{2}, \frac{4}{5}), (1, -\frac{4}{3}), (2, -1)\} \quad f(x) = \{(1,2), (-1,2), (2,2), (-2,2), (\sqrt{3}, -1), (-\sqrt{3}, -1)\}$$

$$f(x) = \{(2,1), (2,1), (5,9), (-2,0)\}$$

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

$$h = 2f+g \Rightarrow \{(2,2), (2,2), (-2,4), (-2,4)\}$$

$$x=2 \Rightarrow 2(1)+2=4 \quad x=2 \Rightarrow 2(0)+2=2$$

$$x=2 \Rightarrow 2(1)+2=4$$

$$f(x) = \frac{\sqrt{x+2}}{x-2} \rightarrow \sqrt{x+2} > 0 \rightarrow x > -2 \quad \sqrt{x+2} > 2 \rightarrow x > 2$$

$$x-2 \rightarrow x \neq 2 \rightarrow x \neq 2$$

$$g(x) = [x] + [-x]$$

$$\left(\frac{f}{g+1}\right)(x) = ? \quad x(x-x) = 0 \rightarrow g+1 = 1$$

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

$$D = \{0, 1, 3\}$$

$f(x) = \sqrt{2x - x^2 - F}$ $g(x) = \{(1, 4), (2, 2), (3, 5), (4, 1)\}$ $h(x) = \frac{f(x)}{g(x)} \cdot \{(1, 0), (2, \frac{2}{3}), (3, 0)\}$	$x=1 \rightarrow \sqrt{2-1-F} = 0$ $h(1) = \frac{0}{4} = 0$ $x=2 \rightarrow \sqrt{4-4-F} = \sqrt{-F}$ $h(2) = \frac{\sqrt{-F}}{2}$ $x=3 \rightarrow \sqrt{6-9-F} = \sqrt{-3-F}$ $h(3) = 0$ $x=4 \rightarrow \sqrt{8-16-F} = \sqrt{-8-F}$ $h(4) = 0$	6
$الف) y = x^3 - 3x^2 + 4x$ $\frac{1}{x^2 - 3x} = 0 \rightarrow x \in \mathbb{R}$ $ب) y = \frac{1}{x^2 - 3x}$ $3x^2 - 12x = 1$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ $x = \frac{4 \pm \sqrt{16 - 3}}{6}$ $x = \frac{4 \pm \sqrt{13}}{6}$ $R_f = \{x \in \mathbb{R} \mid x \neq 0, x \neq 3\}$	$3x^2 - 12x + 4 = 0$ $3x^2 - 12x + 4 = 0$ $x = \frac{12 \pm \sqrt{144 - 48}}{6}$ $x = \frac{12 \pm \sqrt{136}}{6}$ $x = \frac{12 \pm 2\sqrt{34}}{6}$ $x = \frac{6 \pm \sqrt{34}}{3}$ $R_f = \{x \in \mathbb{R} \mid x \neq 0, x \neq 3\}$	7
$الف) y = x^3 - 4x^2 + 10$ $ب) y = x^3 - 4x^2 + 10$ $ج) y = \sqrt{x^3 - 4x^2 - 10}$ $د) y = \sqrt{x^3 - 4x^2}$	$الف) y = x^3 - 4x^2 + 10$ $ب) y = x^3 - 4x^2 + 10$ $ج) y = \sqrt{x^3 - 4x^2 - 10}$ $د) y = \sqrt{x^3 - 4x^2}$	8
$الف) y = x^3 - 4x^2 + 10x + 1$ $ب) y = x^3 - 4x^2 + 10x + 1$ $ج) y = \sqrt{x^3 - 4x^2 + 10x + 1}$ $د) y = (x^3 - 4x^2 + 10x + 1)^{1/2}$	$الف) y = x^3 - 4x^2 + 10x + 1$ $ب) y = x^3 - 4x^2 + 10x + 1$ $ج) y = \sqrt{x^3 - 4x^2 + 10x + 1}$ $د) y = (x^3 - 4x^2 + 10x + 1)^{1/2}$	9
$الف) y = \frac{12x + 1}{x - 2}$ $ب) y = \frac{12x + 1}{x + 1}$	$الف) y = \frac{12x + 1}{x - 2}$ $ب) y = \frac{12x + 1}{x + 1}$	10

(۳) x های f باید تخمین برابر باشند! $f(x_n) = \left\{ \left(\frac{1}{x}, 2\right) \left(\frac{x}{2}, -1\right) (2, 2) \left(-\frac{1}{x}, 4\right) \right\}$

هر کدام از x های f را برابر x^2 قرار دهیم! $f(x^2) = \left\{ (1, 2) (-1, 2) (\sqrt{x^2}, -1) (-\sqrt{x^2}, -1) (2, 2) (-2, 2) \right\}$

این عمل روی y های و اعمال می شود: $g^2(x) + 1 = \left\{ (-2, 19) (1, 3) (3, 9) (-1, 1) \right\}$

$$\frac{2f}{g} = \left\{ \left(1, \frac{2 \times 2}{-1}\right) \left(3, \frac{2 \times -1}{2}\right) \text{ و } \left(-1, \frac{2 \times 4}{-}\right) \right\} = \left\{ (1, -4) (3, -1) \right\}$$

(الف) $y = x^3 - 2x^2 + 2x - 1 + 1 = y = (x-1)^3 + 1$ (۷)

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

$R_f = \mathbb{R}$

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

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

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