

$$1) f(x) = \begin{cases} x-1 & [x] \in \mathbb{R} \\ x+3 & [x] \leq 1 \end{cases} \quad y = \sqrt{f(x)-x+1}$$

$$2) [x] > 1 \rightarrow x > \omega$$

$$3) x-1-x+1=x \rightarrow D=x, \quad \text{په افقیات}$$

$$4) [x, +\infty) \cap [\omega, +\infty) \Rightarrow [a, +\infty)$$

$$5) [x] \leq 1 \rightarrow x \leq \omega$$

$$6) x+3-x+1=x+4 \quad x+3 > 0 \rightarrow x > -\frac{3}{1}$$

$$7) \hookrightarrow [-\frac{3}{1}, \omega)$$

$$8) [-\frac{3}{1}, \omega) \cup [\omega, +\infty) \rightarrow [-\frac{3}{1}, +\infty)$$

$$9) \frac{2x^2 + 3x + 1}{(x^2 + x + 1)^2} = \frac{3}{(x^2 + 1)^2}$$

$$12) \frac{2(x^2 + 1)^2}{(x^2 + 1)^2} = \frac{3}{x^2 + 1} \quad x^2 + 1 \neq 0$$

$$13) x \neq \pm \frac{1}{1} \quad D_y = \mathbb{R} - \{\pm \frac{1}{1}\}$$

$$14) \frac{x^2 + 2x - 1 - 1}{x^2 - 1} = \frac{(x-1)(x^2 + 2x + 1)}{(x-1)(x+1)} = \frac{(x+2)(x+1)}{(x+1)}$$

$$17) \Rightarrow C=2$$

$$18) f(x) = \begin{cases} x=1 \rightarrow \frac{a+2}{1+b} = 3 \Rightarrow a+2 = 3+b \\ a = b+1 \end{cases}$$

$$19) x=-1 \rightarrow \frac{x-a}{-1+b} = 1 \Rightarrow x-a = b-1 \Rightarrow a = x-b$$

$$20) 3b+1 = 3-b \quad 4b = 2 \Rightarrow b = \frac{1}{2} \rightarrow a = \frac{3}{2}$$

$$21) b+c = \frac{1}{2} + 2 = \frac{5}{2}$$

$$(5) \quad g(x) = \frac{x^r - 1}{x^r + ax + b} \quad f(x) = \frac{x+1}{x-c} \quad f(ax) = g(x)$$

$$g(x) = \frac{(x-1)(x+1)}{(x-c)^r} = \frac{x+1}{x-c}$$

$\rightarrow D = \mathbb{R} - \{c\}$
 3 $\leftarrow$ دامنه نیز برابر

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$$\Rightarrow x - c = x - 1 \Rightarrow c = 1 \quad a + b + c = 0$$

$$(x-1)^r = x^r - rx + 1 \Rightarrow a = -r \quad b = 1$$

(6)

$$g(x) = ((x+1)-r)^r ((x+1)+1) + ((1-x)-r)^r ((1-x)-1)$$

$$= (x-r)^r (x+2) + (-x-r)^r (-x)$$

$$(x^r - rx^{r-1} + \dots) + (-x^r - rx^{r-1} - \dots) = -1x^r$$

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(7) $f(1-rx) = \begin{cases} \sqrt{x} + rx & x \leq 0 \\ \sqrt{x} & x > 0 \end{cases}$

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

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

$$f(-1) + f(x) = 2$$

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(8) $f(x + \sqrt{x}) = x^r + rx$

$$f(x) \xrightarrow{x=c} f(c + \sqrt{c}) = c^r + r(c) = 2c$$

(9) $f(x-1) + f(1/x) \rightarrow (x-1)^r + (1/x-1)^r + (1-x)^r + \dots$

$$(x-1)^r + (1-x)^r = x^r - rx(x-1) + (-x^r) - rx(1-x)$$

$$= 0$$

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Senobar

9) $f(x) = \sqrt{x-2a} + k - 1$ و $g(x) = \sqrt{b-x} + 3k$

$Df = x \geq \frac{3a}{2}$ و $Dg = x \leq \frac{b}{2}$

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استخراج دامنه ها $\rightarrow \frac{3a}{2} = 1 \rightarrow \frac{3a}{2} = 1 \rightarrow a = \frac{2}{3}$ و $\frac{b}{2} = 1 \rightarrow b = 2$

$2(\sqrt{x-2} + k - 1) - (\sqrt{2-x} + 3k)$

$= 2k - 2 - 3k = k \rightarrow 2k = 2 \Rightarrow k = 1$

$\frac{3a}{2} - \frac{b}{2} - k = 2(\frac{2}{3}) - \frac{2}{2} - (-1) = 1$

10)

$f(x) = \sqrt{m-x} + h \rightarrow Df = (-\infty, m] \cap [-1, 5]$

$g(x) = \sqrt{2x+2} \rightarrow Dg = [-1, +\infty)$

$Df \cap Dg = [-1, 5] \Rightarrow m = 5$

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$f - g(x) = 5\sqrt{2}$

$\sqrt{5-x} + h - 2\sqrt{2} = 5\sqrt{2} \Rightarrow h = 7\sqrt{2} - 2$

$m+h = 5 - 2 + 7\sqrt{2} = 3 + 7\sqrt{2}$

پس اینها یکدیگر دارند و هم دفتر B