

$$[x] > 4 \rightarrow x > 4 \rightarrow f(x) = 2x+1 \rightarrow y = \sqrt{2x+1-x+1} = \sqrt{x} \quad \text{و } \bar{G}$$

$$[x] < 4 \rightarrow x < 4 \rightarrow f(x) = 4x+3 \rightarrow y = \sqrt{4x+3-x+1} = \sqrt{3x+4}$$

$$\rightarrow 3x+4 > 0 \rightarrow 3x > -4 \rightarrow x > -\frac{4}{3} \Rightarrow I \cap II : \boxed{-\frac{4}{3} < x < 4}$$

$$\rightarrow III \cap I \cap II : -\frac{4}{3} < x \rightarrow D = [-\frac{4}{3}, +\infty) \quad \checkmark$$

$$y = \frac{2x^r + 4x^r + 4x^r + 3}{(4x^r + 4x^r + 1)^r} = \frac{3(1x^r + 1x^r + 1x^r + 1)}{(4x^r + 1)^r} = \frac{3(4x^r + 1)^r}{(4x^r + 1)^r}$$

$$x \neq -\frac{1}{4} \rightarrow \boxed{y = \frac{3}{4x^r + 1}} \quad D = R - \{-\frac{1}{4}\}$$

$$x^r + 2x^r - x - 2 \rightarrow 1 + 2 - 1 - 2 = 0 \rightarrow \text{بر } x=1 \text{ محقق می شود}$$

$$\frac{x^r + 2x^r - x - 2}{x^r - x^r} \cdot \frac{x-1}{x^r + 2x^r + 1} \rightarrow \frac{x^r + 2x^r - x - 2}{x^r - x^r} = (x-1)(x+1)(x+2) \quad *$$

$$\frac{2x^r - x - 2}{x^r - x^r} = \frac{2x^r - x - 2}{x^r - x^r}$$

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

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

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

$$\begin{cases} a-3b = 1 \\ -a-b = -3 \end{cases} \rightarrow a - \frac{3}{4} = 1 \rightarrow \boxed{a = \frac{7}{4}} \quad \checkmark$$

$$-a-b = -3$$

$$-4b = -7 \rightarrow \boxed{b = \frac{7}{4}} \quad \checkmark$$

$$g(x) = x+c = x+2 = f(x)$$

$$\rightarrow \boxed{c = 2} \quad \checkmark$$

$$b+c = \frac{1}{4} + 2 = \boxed{\frac{9}{4}} \quad \checkmark$$

$$a+b+c = 1-2+1 = 0 \quad \checkmark$$

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

$$f(x) = \frac{x+1}{x-1} \quad D_f = R - \{1\}$$

$$x-1 \neq 0 \rightarrow x \neq 1$$

$$D_g = R - \{1, c\}$$

$$D_f = D_g \Rightarrow \boxed{c = 1} \quad \checkmark$$

$$g(x) = \frac{(x+1)(x-1)}{(x-1)(x-1)} = \frac{(x+1)(x-1)}{x^2 + ax + b}$$

$$x^2 + 1 - 2x = x^2 + b + ax$$

$$\boxed{a = -2} \quad \checkmark$$

$$\boxed{b = 1} \quad \checkmark$$

$$f(n+1) = (n+1-r)^r (n+1-1) = n(n-r)^r$$

$$f(1-n) = (1-n-r)^r (1-n-1) = (-n)(-n-r)^r = -n(n+r)^r$$

$$f(n+1) + f(1-n) = n[(n-r)^r - (n+r)^r] = n(n^r - r^r - (n^r + r^r))$$

$$= n(n^r - r^r - n^r - r^r) = -2nr^r$$

$$1-rn=1 \rightarrow rn=r \rightarrow n=1 \rightarrow f(1) = \sqrt{1} = 1$$

$$1-rn=r \rightarrow rn=r \rightarrow n=1 \rightarrow f(r) = \sqrt{r-1} + r$$

$$n+\sqrt{n}=4 \rightarrow n=5 \rightarrow f(4) = \sqrt{4-5} + \sqrt{5} = \sqrt{5} - 1 + \sqrt{5} = 2\sqrt{5} - 1$$

$$(n-1) = -(1-n) \quad f(n) = n^r + n \quad f(-n) = -n^r - n \quad f(n-1) + f(1-n) = 0$$

$$rf-g = r[\sqrt{a-n} + k-1] - [\sqrt{b-n} + rk] = 0$$

$$r\sqrt{a-n} + rk - r - \sqrt{b-n} - rk = 0 \rightarrow r\sqrt{a-n} - \sqrt{b-n} = r - rk \rightarrow r\sqrt{a-n} - \sqrt{b-n} = r(1-k)$$

$$\star \begin{cases} a \rightarrow \sqrt{a-n} \geq 0 \rightarrow \sqrt{a-n} \geq r(1-k) \\ b \rightarrow \sqrt{b-n} \geq 0 \rightarrow \sqrt{b-n} \geq r(1-k) \end{cases}$$

$$ra - \frac{b}{r} - k = f - \frac{f}{r} - (-1) = f - \frac{f}{r} + 1 = 0$$

$$rx+r \geq 0 \rightarrow rn \geq -r \rightarrow n \geq -1 \quad Dg \cap Df = [-1, \infty)$$

$$m-n \geq 0 \rightarrow n \leq m \quad g(r) = \sqrt{r(m-r)} = \sqrt{r} \sqrt{m-r}$$

$$f(r) = \sqrt{r} = 4\sqrt{r} \rightarrow f(r) = \sqrt{r} \quad f(r) = \sqrt{r} + n = 1\sqrt{r}$$

$$m+n \wedge \sqrt{r} = r + \sqrt{r} = \omega + \sqrt{r}$$

Arman