

الف) $f(x) = \sqrt{x+1}$ $x+1 \geq 0 \Rightarrow x \geq -1 \Rightarrow D_f = \mathbb{R}^+ \cup \{0\}$ $D_g = \mathbb{R} \Rightarrow$ سای است

ب) $f(x) = \frac{x^2 + 2x + 1}{x^2 + 2x + 1} = 1$ $g(x) = 1 \Rightarrow$ سای است

ج) $\sin x - \frac{1}{2} \neq 0 \Rightarrow \sin x \neq \frac{1}{2} \Rightarrow x \neq \frac{\pi}{6} + 2k\pi, x \neq \frac{5\pi}{6} + 2k\pi \Rightarrow D_f = \mathbb{R} \Rightarrow D_g = \mathbb{R} \Rightarrow$ سای است

د) $|x| \neq 0 \Rightarrow x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$ $\lim_{x \rightarrow 0} \frac{1}{x} \rightarrow \infty \Rightarrow$ سای است

الف) $f(x) \Rightarrow x^2 + 1 \neq 0 \Rightarrow x^2 \geq 0 \Rightarrow x^2 + 1 \geq 1 \Rightarrow D_f = \mathbb{R}$ $g(x) \Rightarrow x - [x] \rightarrow$ سای است

ب) $f(x) \Rightarrow [x] \neq 0 \Rightarrow D_f = \mathbb{R} - [0, \frac{1}{2})$ $g(x) \Rightarrow x[x] \neq 0 \Rightarrow D_g = \mathbb{R} - [0, \frac{1}{2})$ برابریست

ج) $f(x) \Rightarrow x - |x| > 0 \Rightarrow x > 0 \Rightarrow D_f = \mathbb{R}^+$ $g(x) \Rightarrow |x| - x > 0 \Rightarrow x < 0 \Rightarrow D_g = \mathbb{R}^-$ برابریست

د) $g(1) = 2$ $f(n+1) = n(n+1) = \frac{n(n+1)(n+1)}{(n+1)} \Rightarrow$ برابریست

$f(x) + g(x) = x^2 + x + 1$

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

$f'(x) - g'(x) = (2x+1) - x^2 =$

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

$2g(x) = 2x \Rightarrow g(x) = x$

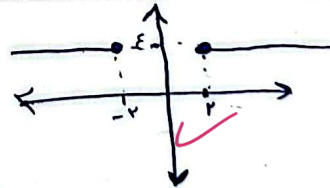
$f(x) + x = x^2 + x + 1$

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

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

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

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



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

$D_f = D_g = (-\infty, -2] \cup [2, +\infty)$

$f(x) = \frac{a}{x} + \frac{b}{x}$

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

$f(x) = g(x)$

$g(x) \rightarrow x^2 - 2x - 2 \neq 0 \Rightarrow (x-1)^2 - 3 \neq 0 \Rightarrow x \neq 1 \pm \sqrt{3} \Rightarrow D_g = \mathbb{R} - \{1 \pm \sqrt{3}\}$

$f(x) \rightarrow (x+1)(x-\frac{a}{x}) = x^2 - \frac{a}{x} - 1 \Rightarrow m = \frac{a}{x} \Rightarrow x = -\frac{a}{x}$

$\frac{a}{x} + \frac{b}{x} = \frac{x-b}{x^2 - 2x - 2}$

$ax + b = x - b \Rightarrow x = 0 \Rightarrow b = -b \Rightarrow b = 0$

$x=1 \Rightarrow \frac{a}{1} + \frac{b}{1} = 1 + \frac{b}{1} = 0 \Rightarrow a = -b$

$am - bn = \frac{1}{x} - \frac{b}{x} = \frac{1-b}{x} = \frac{1-b}{x} = \frac{1-b}{x}$

$$f(n) = \frac{bn+r}{n+b} \quad g(n) = c \quad D_g = \mathbb{R} - \{a\}$$

$$D_f = \mathbb{R} - \left\{ -\frac{b}{\lambda} \right\} \Rightarrow D_f = D_g \Rightarrow a = -\frac{b}{\lambda} \Rightarrow b = -\lambda a = \begin{matrix} -\varepsilon \\ \varepsilon \end{matrix}$$

$$\frac{-\lambda a n + r}{n - \lambda a} \xrightarrow{n=0} \frac{r}{-\varepsilon \lambda a} = c \Rightarrow \frac{c = -1}{\varepsilon a} \quad \text{① } \frac{1}{\lambda} \times \varepsilon = \boxed{\varepsilon} \quad \text{② } -\frac{1}{\lambda} \times \varepsilon = \boxed{-\varepsilon} \rightarrow \frac{ab}{c} = \pm \varepsilon$$

$$n=1 \quad \frac{-\lambda a + r}{1 - \lambda a} = \frac{-1}{\varepsilon a} \cdot c \quad \lambda a - 1 = -\lambda a^2 + \lambda a \Rightarrow a^2 = \frac{1}{\varepsilon} \Rightarrow a = \pm \frac{1}{\sqrt{\varepsilon}}$$

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

$$g = \{(-1, 2), (2, \varepsilon), (3, -2), (0, \frac{1}{\varepsilon})\} \quad \frac{fg}{f+g} = \{(-1, \varepsilon), (2, 1), (3, 3)\}$$

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

$$\frac{fg}{f+g} \quad \begin{matrix} n=-1 \rightarrow \frac{-1}{-\varepsilon} = \varepsilon \\ n=2 \rightarrow \frac{2}{1} = 2 \\ n=3 \rightarrow \frac{3}{\varepsilon} = 3 \end{matrix} \Rightarrow \boxed{a, b, c} = \varepsilon, 1, 3$$

$$f = \{(r, a), (-r, ra - rb), (c, d), (r, d)\} \xrightarrow{f \cup g} a = d$$

$$g = \{(r, -1), (-r, 1), (a - rb, d)\}$$

$$a = -1 \quad -r - rb = 1 \Rightarrow b = -2 \quad -1 + 4 = c = d$$

$$d + c = a + c = -1 + d = \boxed{\varepsilon}$$

$$-(n^2 - n + m) \geq 0 \Rightarrow n^2 - n + m \leq 0 \Rightarrow \Delta \leq 0 \Rightarrow 1 - 4m \leq 0 \Rightarrow m \geq \frac{1}{4}$$

$$D_f = D_g \Rightarrow \{a\}$$

$$-n^2 + (a)n - a^2 = -n^2 + n - m \Rightarrow ra = 1 \Rightarrow \boxed{a = \frac{1}{r}} \Rightarrow \boxed{a + b = \frac{1}{r}}$$

$$-a^2 = -m \quad m = \frac{1}{\varepsilon} \quad \boxed{b = 0}$$

$$n=0 \quad \frac{r}{-c} = \frac{a}{b} \Rightarrow rb = -ac$$

$$\frac{r}{n-c} = \frac{r(n+\frac{a}{r})}{(n-c)(n+\frac{a}{r})} \Rightarrow \frac{a}{r} - c = 1 \Rightarrow a - rc = 1r$$

$$D_f = D_g \Rightarrow \mathbb{R} - \{c, -\frac{a}{r}\} = \mathbb{R} - \{c\} \Rightarrow c = -\frac{a}{r} \Rightarrow a = -rc$$

$$-rc - rc = 1r \Rightarrow c = -\frac{1}{2} \quad a = \frac{1}{2} \quad b = 1 \quad \boxed{a+b+c = 1r}$$