

1) $D_{f(x)} = [0, +\infty)$, $D_{g(x)} = \mathbb{R}$

$[0, +\infty) \neq \mathbb{R} \Rightarrow D_{f(x)} \neq D_{g(x)} \Rightarrow f(x) \neq g(x)$

2) $f(x) = \frac{-2 \pm \sqrt{4-4}}{2} = 0$

$\Rightarrow D_{f(x)} = D_{g(x)} = \mathbb{R} \Rightarrow f(x) = g(x)$

3) $\sin x \leq 1 \Rightarrow 1 - \sin x \neq 0 \Rightarrow D_{f(x)} = \mathbb{R}$

$D_{f(x)} = D_{g(x)}$ و $f(x) = \frac{1 - \sin x (1 - \sin x)}{1 - \sin x} \Rightarrow 1 - \sin x$

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

4) $D_{f(x)} = \mathbb{R} - \{0\}$ و $D_{g(x)} = \mathbb{R} - \{0\}$

$D_{f(x)} = D_{g(x)} \Rightarrow f(x) = g(x)$

5) $D_{f(x)} = \mathbb{R}$ و $D_{g(x)} = \mathbb{R}$

$\left[\frac{x^2+1}{x^2+1} \right] = \left[1 - \frac{1}{x^2+1} \right] = 0$ و $[x - [x]] = 0$

$0 \leq x - [x] < 1$

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

6) $D_{f(x)} = [x] \neq 0 \Rightarrow x \neq [0, 1) \Rightarrow x \in [0, 1) \Rightarrow \mathbb{R} - [0, 1)$

$D_{g(x)} = [x] \neq 0 \Rightarrow [x] \neq 0 \Rightarrow x \in [0, 1) \Rightarrow \mathbb{R} - [0, 1)$

$D_{f(x)} = D_{g(x)} \Rightarrow f(x) = g(x)$

$$b) D_{f(x)} = D_{g(x)} = \mathbb{R} \Rightarrow f(x) = g(x)$$

$$x = 1 \rightarrow f(x) = g(x) = 1$$

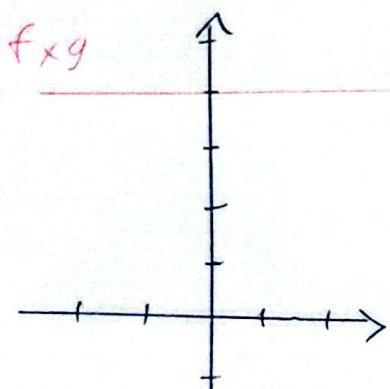
$$x \neq 1 \rightarrow \frac{x^r - x}{x-1} \Rightarrow \frac{x(x^{r-1} - 1)}{x-1} = x(x+1) = x^r + x$$

$$f(x) = g(x)$$

$$\begin{cases} f(x) - g(x) \\ f(x) + g(x) \end{cases} = \begin{cases} 1f(x) = 1x^r + 1 \Rightarrow f(x) = x^r + 1 \\ 1g(x) = x \end{cases}$$

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

$$f \circ g = (x + \sqrt{x^r - 1})(x - \sqrt{x^r - 1}) = x^r - x^r + 1 = 1$$



$$rx^r - rx - d \neq 0 \Rightarrow (r-d \neq -r) \Rightarrow x \neq -1, \frac{d}{r} \Rightarrow D = \mathbb{R} - \{-1, \frac{d}{r}\}$$

$$\Rightarrow D_{f(x)} = \mathbb{R} - \{-1, \frac{d}{r}\} \Rightarrow \begin{cases} 1+m+n=0 \\ \frac{rd}{r} - \frac{d}{r}m+n=0 \end{cases} \Rightarrow \frac{rd}{r} - \frac{d}{r}m+n-1-m-n=0$$

$$\Rightarrow \frac{rd}{r} = \frac{r}{r}m \Rightarrow m = \frac{r}{r} \Rightarrow n = -\frac{d}{r} \Rightarrow x^r - \frac{r}{r}x - \frac{d}{r}$$

$$\frac{x-b}{rx^r-rx-d} \xrightarrow{+r} \frac{ax+r}{x^r-\frac{r}{r}x-d} \Rightarrow b = -r \Rightarrow am - bn = \frac{r}{r} - 1 = \frac{-r}{r}$$

$$\frac{bx+r}{ax+b} \leq c \Rightarrow bx+r \leq c(ax+b) \Rightarrow bx+r \leq acx+bc \Rightarrow bc \leq r$$

$$ax \leq bx \Rightarrow a \leq b$$

$$\Rightarrow ac \leq r \Rightarrow c \leq \frac{r}{a} \Rightarrow c \leq \pm \frac{1}{r}, b \leq \pm r$$

$$|a| \leq r \leq 0 \Rightarrow a = \pm \frac{1}{r}$$

$$\frac{ab}{c} \begin{cases} \rightarrow \frac{r(-\frac{1}{r})}{\frac{1}{r}} = -r \\ \rightarrow \frac{-r(\frac{1}{r})}{-\frac{1}{r}} = r \end{cases}$$

$$\Rightarrow f = \{(-1, 2), (2, 4), (3, -2), (0, 0, d)\}$$

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

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

$$\frac{rg}{f+g} = \{(-1, 4), (2, 1), (3, 3)\}$$

$$R\left(\frac{rg}{f+g}\right) = \{4, 1, 3\}$$

$$\begin{cases} a = d \\ ra - rb = 1 \Rightarrow -r - rb = 1 \Rightarrow -r = rb \Rightarrow -r \leq b \\ a - rb \leq c \\ a = -1 \Rightarrow d = -1 \end{cases}$$

$$\Rightarrow -1 - r(-r) \leq c \Rightarrow -1 + r \leq c \Rightarrow c \leq d$$

$$-1 + d \leq c + d \leq r$$

$$\Rightarrow -x^2 + x - m \leq 0 \Rightarrow -(x^2 - x + m) \leq 0 \Rightarrow \frac{2^{\star}}{-\frac{1}{0}}$$

$$\Rightarrow -(x - \frac{1}{2})^2 \rightarrow \frac{1^{\star}}{-\frac{1}{0}} \rightarrow a = \frac{1}{2}, b = 0$$

$$a + b = \boxed{\frac{1}{2}}$$

$$D_{g(x)} = R - \{C\} = D_{f(x)}$$

$$\Rightarrow x^2 + 4x + b = (x - c)^2 \Rightarrow x^2 + 4x + b = x^2 - 2cx + c^2$$

$$\Rightarrow -2cx = 4 \Rightarrow c = -2$$

$$\Rightarrow b = 9$$

$$\frac{2}{x+3} \xrightarrow{\times(x+3)} \frac{2x+a}{x^2+4x+9} \Rightarrow 2x+4 = 2x+a \Rightarrow a=4$$

$$a + b + c = 4 + 9 + (-2) = \boxed{11}$$