[illegible] - دهم [illegible] - [illegible] ۸

۱۸/۲۵

-۵

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

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

ب) ریشه‌ی مخرج $f(x)$ $= \dfrac{-5 \pm \sqrt{25-28}}{2}$ ✗

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

ج) $\sin x \leq 1 \Rightarrow 2\sin x - 3 \neq 0 \Rightarrow D_{f(x)} = \mathbb{R}$

$D_{f(x)} = D_{g(x)}$, $f(x) = \dfrac{2\sin x(2\sin x - 3)}{2\sin x - 3} \Rightarrow = 2\sin x$

هیچ‌وقت ۰ نمی‌شود

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

د) $D_{f(x)} = \mathbb{R} - \{0\}$, $D_{g(x)} = \mathbb{R} - \{0\}$

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

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الف) $D_{f(x)} = \mathbb{R}$, $D_{g(x)} = \mathbb{R}$ ۰/۵

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

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

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

ب) ۰/۵ $D_{f(x)} = [2x] \neq 0 \Rightarrow 2x \neq [0, 1) \Rightarrow x \neq [0, 0/5) = \mathbb{R} - [0, 0/5)$

$D_{g(x)} = 2[x] \neq 0 \Rightarrow [x] \neq 0 \Rightarrow x \neq [0, 1) \Rightarrow \mathbb{R} - [0, 1)$

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

۲) $D_{f(x)} = D_{g(x)} = \mathbb{R} \Rightarrow f(x) = g(x)$ ↳ مطلوب نیست!

۰٫۲۵

۱) $x = 1 \rightarrow f(x) = g(x) = 2$

۰٫۵

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

$f(x) = g(x)$

۳

$$\begin{cases} f(x) - g(x) \\ + \\ f(x) + g(x) \end{cases} = 2f(x) = 2x^2 + 2 \Rightarrow f(x) = x^2 + 1$$

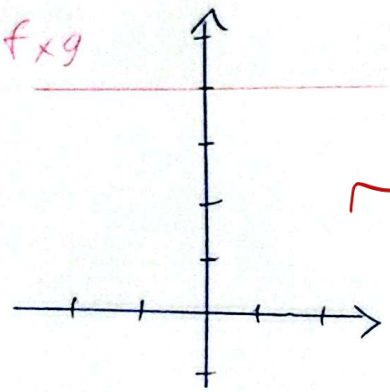
$$g \quad g(x) = x$$

$f^2(x) - g^2(x) = x^4 + 2x^2 + 1 - x^2 = x^4 + x^2 + 1$

۴

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

۱٫۵



با توجه به دامنه علامت ← دامنه $f \times g$ باید $\mathbb{R}$ شود

۲

$2x^2 - 2x - 5 \neq 0 \Rightarrow (\Delta = -36) \Rightarrow x \neq -1, \frac{5}{2} \Rightarrow D = \mathbb{R} - \{-1, \frac{5}{2}\}$

$\Rightarrow D_{f(x)} = \mathbb{R} - \{-1, \frac{5}{2}\} \Rightarrow \begin{cases} 1 + m + n = 0 \\ \frac{25}{4} - \frac{5}{2}m + n = 0 \end{cases} \Rightarrow \frac{25}{4} - \frac{5}{2}m + n - 1 - m - n = 0$

$\Rightarrow \frac{21}{4} = \frac{7}{2}m \Rightarrow m = \frac{3}{2} \Rightarrow n = \frac{-5}{2} \rightarrow x^2 - \frac{3}{2}x - \frac{5}{2}$

$\frac{x-b}{2x^2-2x-5} \xrightarrow{\div 2} \frac{ax+2}{x^2 - \frac{3}{2}x - \frac{5}{2}} \xrightarrow{\div 2} \Rightarrow b = -4 \Rightarrow am - bn = \frac{3}{4} - 10 = \boxed{\frac{-37}{4}}$

$a = 1$

۶

$$\frac{bx+2}{8cx+b} = c \Rightarrow bx+2 = 8cx+bc \Rightarrow bc = 2$$

$$8cx = bx \Rightarrow 8c = b$$

$$\Rightarrow 8c^2 = 2 \Rightarrow c^2 = \frac{1}{4} \Rightarrow c = \pm\frac{1}{2}, b = \pm 4$$

$$8a \pm 4 = 0 \Rightarrow a = \mp\frac{1}{2}$$

$$\frac{ab}{c} \begin{cases} \frac{4(-\frac{1}{2})}{\frac{1}{2}} = -4 \\ \frac{-4(\frac{1}{2})}{-\frac{1}{2}} = 4 \end{cases}$$

۷

$$\Rightarrow f = \{(-1,2),(2,4),(3,-2),(0,0/5)\}$$

$$2g = \{(2,8),(3,12),(-1,-8),(5,0)\}$$

$$f+g = \{(-1,-2),(2,8),(3,4)\}$$

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

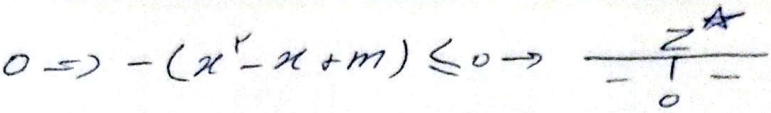
$$R_{(\frac{2g}{f+g})} = \{4,1,3\}$$

۱

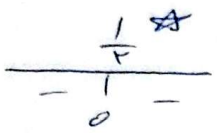
$$\begin{cases} a = d \\ 2a - 2b = 1 \Rightarrow -2 - 2b = 1 \Rightarrow -4 = 2b \Rightarrow -2 = b \\ a - 2b = c \\ a = -1 \Rightarrow d = -1 \end{cases}$$

$$\Rightarrow -1 - 2(-2) = c \Rightarrow -1 + 4 = c \Rightarrow c = 3$$

$$-1 + 3 = c + d = \boxed{2}$$

$\Rightarrow -x^2+x-m \le 0 \Rightarrow -(x^2-x+m) \le 0 \rightarrow$  9

(۳)

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

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

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

$\Rightarrow x^2+4x+b=(x-C)^2 \Rightarrow x^2+4x+b=x^2-2Cx+C^2$

$\Rightarrow -2Cx=4 \Rightarrow C=-2$

$\Rightarrow b=9$

$$\frac{2}{x+2} = \frac{2x+a}{x^2+4x+9} \Rightarrow 2x+4=2x+a \Rightarrow a=4$$

($\times(x+2)$ on the left, $\times(x+2)$ on the right)

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