آرین شفائی

DATE / / SUBJECT:

۱) الف) $\sqrt{x|x|}$ و $x^2 = x|x|$ [illegible] $x \to +$ [illegible] $f_{(x)} \neq g_{(x)}$

$g(x) = x$ [illegible]

ب) $f_{(x)} = \frac{x^3+4x^2+x+4}{x^2+5x+7} = \frac{x^2+5x+7}{x^2+5x+7} = 1$ ، $g(x) = 1$ $f_{(x)} = g_{(x)}$

ج) $(\sin x) = k$ ، $\frac{4k^2-6k}{2k-3} = f_{(x)} = \frac{2k\cancel{(2k-3)}}{\cancel{(2k-3)}}$ ، $2k = 2\sin x = g_{(x)}$ ، $f_{(x)}$ و $g_{(x)}$

د) if $x \to +$ ، $f_{(x)} = \frac{x}{|x|} = 1$ ، $g_{(x)} = \frac{|x|}{x} = 1$ ، $f_{(x)} = g_{(x)}$

if $(x) \to -$ ، $f_{(x)} = \frac{x}{|x|} = -1$ ، $g_{(x)} = \frac{|x|}{x} = -1$

۲) الف) $f_{(x)} = \left[\frac{x^2}{x^2+1}\right] < 1$ ، $\left[\frac{x^2}{x^2+1}\right] = 0$ ، $f_{(x)} = g_{(x)}$

$g(x) = [x-[x]]$ ، $x-[x] < 1$ ، $[x-[x]] = 0$

ب) $\frac{1}{[2x]}$ if $x = 1/75$ ، $[2x] = 3$ ، $\frac{1}{[2x]} = \frac{1}{3}$ ، $f_{(x)} \neq g_{(x)}$

$\frac{1}{2[x]} = \frac{1}{2}$

ج) $f_{(x)}$ ، x ــــ [illegible] ، $g_{(x)} \neq f_{(x)}$

$g(x)$ ، x ــــ [illegible]

CLASS memo

1) $\frac{x^2-x}{x-1} = x^2+x \Big\} \Rightarrow \frac{x(x^2-1)}{x-1} = \boxed{\frac{x\cancel{(x-1)}(x+1)}{\cancel{(x-1)}} = x(x+1)} \checkmark \Big\} \Rightarrow g(x) = f(x)$

$\boxed{1^2+1=2}$

۳)

$\cancel{2}f(x) + \cancel{g(x)} + f(x) - \cancel{g(x)} = 2f(x) = 2x^2+2 \Rightarrow f(x) = \boxed{x^2+1} \Rightarrow \boxed{g(x) = x}$

$\Rightarrow f^2(x) - g^2(x) = x^4+2x^2+1 - x^2 = \boxed{x^4 - x^2 + 1}$

۴)

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

۵)

$\frac{x-b}{2x^2-3x-5} = \frac{ax+2}{x^2-mx+n} \Big\} \Rightarrow 2x^2-3x-5 = 2x^2-2mx+2n \Rightarrow m = \frac{3}{2} \quad n = -\frac{5}{2} \Big\} \Rightarrow \frac{1}{2}\times\frac{3}{2} - \left(-4\times\frac{-5}{2}\right) = \frac{3}{4} - 10 = -\frac{37}{4}$

$\Rightarrow x-b = 2ax+4 \Rightarrow b = -4$

$2ax = x \Rightarrow ax = \frac{1}{2}x \Rightarrow a = \frac{1}{2}$

۶)

$\frac{bx+2}{8x+b} = c \Rightarrow bx+2 = k(8x+b) \Rightarrow b = 8k \quad kb = 2$

$\Rightarrow k(8k) = 2 = 8k^2 \Rightarrow \frac{1}{4} = k^2 \Rightarrow k = \pm\frac{1}{2}$

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

$\Rightarrow 1): \frac{-\frac{1}{2}\times -4}{-\frac{1}{2}} = 4$

$2) \frac{-\frac{1}{2}\times +4}{+\frac{1}{2}} = -4$

$\Big\} \Rightarrow \boxed{\frac{a.b}{c} \in \{-4, 4\}}$

۷)

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

$\frac{2g}{f+g}=\frac{\{(2,8),(3,12),(-1,-8),(5,0)\}}{\{(2,8),(3,4),(-1,-2)\}}=\{(2,1),(3,3),(-1,4)\}$

$a=-1$

۸)

$-3-2b=1$

$-4=2b \Rightarrow b=-2$

$-1+6=\boxed{5=c} \Rightarrow \boxed{5-1=4}$

$\boxed{x=-1}$

۹)

$g(x)=\{(a,b)\}$ تک عضوی

$\Rightarrow -x^2+x-m=0$
$\Rightarrow x^2-x+m=0$ $\Rightarrow \Delta=0 \rightarrow 1-4m=0 \Rightarrow m=\frac{1}{4} \Rightarrow x^2=\frac{1}{4} \Rightarrow x=\frac{1}{2}$

$\Rightarrow a=\frac{1}{2},\ b=0 \Rightarrow \boxed{a+b=\frac{1}{2}}$

۱۰)

$(2x+a)(x-c)=2x^2-2xc+ax-ac=2x^2+x(a-2c)-ac=2x^2+12x+2b$

$\Rightarrow a-2c=12 \quad -ac=2b \Rightarrow b=\frac{-ac}{2}$

$(x-c)^2=x^2+6x+b$

$x^2-2cx+c^2=x^2+6x+b \Rightarrow c=-3$

$b=c^2=9$

$\Rightarrow a=6$

$\Rightarrow \boxed{9+6-3=12}$