الف) $f(x)=\sqrt{x|x|}$ ، $g(x)=x$ (1

$x.|x| \geq 0 \rightarrow x \geq 0 \rightarrow |x|=x$ $x|x|=x^2 \geq 0$

$Df=\{x \geq 0\}$ $f(x)=\sqrt{x|x|}=\sqrt{x^2}=|x|$

$f(x)=x \rightarrow (x \geq 0)$ $f(x)=x$ $g(x)=x$

توابع برابرند $f(x)=g(x)$

ب) $f(x)=\dfrac{(x+3)(x+1)+x+4}{x^2+5x+7}$ ، $g(x)=1$

Δ منفی نداریم $\leftarrow x^2+5x+7$

$Df=R-\{-1\}$ $Dg=R$

$x^2+4x+3+x+4=x^2+5x+7$

$f(x)=\dfrac{x^2+5x+7}{x^2+5x+7}$ $f(x)=1$ برابرند

ج) $g(x)=3\sin x$ ، $f(x)=\dfrac{2\sin^2 x-4\sin x}{2\sin x-3}$

$2\sin x-3 \neq 0$ $\sin x \neq \dfrac{3}{2}$ $\dfrac{2\sin x(2\sin x-3)}{2\sin x-3}$

$f(x)=2\sin x=g(x)$ برابرند

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$f(x)=\frac{x}{|x|}$, $g(x)=\frac{|x|}{x}$ $D_f = R-\{0\}$

$|x|=x$ $f(x)=\frac{x}{x}=1$ $g(x)=\frac{x}{x}=1$

$|x|=-x$ $f(x)=\frac{x}{-x}$ $g(x)=\frac{-x}{x}$

بله برابرند

الف) $f(x)=\left[1-\frac{1}{x^2+1}\right]=0$, $g(x)=[x-[x]]=$ {۲ ; ۰

ب) $D_f=[2x]\neq 0 \rightarrow x\neq [0,\frac{1}{2})=R-\{[0,\frac{1}{2})\}$ برابرند

$D_g=2[x]\neq 0 \rightarrow [x]\neq 0 \rightarrow [0,1)\rightarrow R-\{[0,1)\}$ برابرند نیست

ج) $x-|x|>0$ $D_f=\emptyset$, $D_g=|x|-x>0\rightarrow(0,+\infty)$ برابرند نیست.

د) $\frac{x^3-x}{x-1}=\frac{x(x^2-1)}{x-1}=\frac{x(x-1)(x+1)}{x-1}=$

x^2+x برابرند

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$f(x)+g(x)=x^2+x+1$ (۳

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

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

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

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

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

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

$(x^2+1)^2=x^4+2x^2+1 \rightarrow x^2=x^2$

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

$f(x)=x-\sqrt{x^2-4}$ $g(x)=x+\sqrt{x^2-4}$ (۴

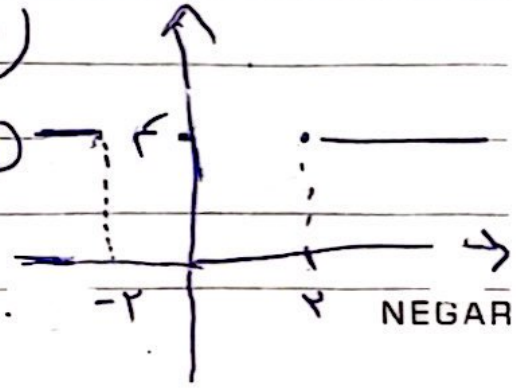
$f(x)\times g(x)=(x-\sqrt{x^2-4})(x+\sqrt{x^2-4})$

$f(x)\times g(x)=x^2-(x^2-4)=4$

$x^2-4\geq 0 \rightarrow |x|\geq 2 \rightarrow x\in(-2,x\geq 2$

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

$f(x)\cdot g(x)=4 \quad x\in D$



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$f(x)=\frac{ax+2}{x^2-mx+n}$ $g(x)=\frac{x-b}{2x^2-3x-5}$ (a

$\frac{ax+2}{x^2-mx+n}=\frac{x-b}{2x^2-3x-5}=$

$(ax+2)(2x^2-3x-5)=(x-b)(x^2-mx+n)$

$2ax^3-3ax^2-5ax+4x^2-6x-10$

$2ax^3+(-3a+4)x^2+(-5a-6)x-10$

$x^3-mx^2+nx-bx^2+bmx-bn=$

$x^3+(-m-b)x^2+(n+bm)x-bn$

$2a=1\rightarrow a=\frac{1}{2}$ $m+b=-\frac{3}{2}$

$n+bm=-17$ $bm=10$

$am-bn=\frac{1}{2}\times\left(-\frac{3}{2}\right)-(-1)-10=-\frac{43}{4}$

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$f(x)=\frac{bx+2}{8x+b}=c \rightarrow bx+2=8cx+cb$ (۶

$bx+2=c(8x+b) \rightarrow b+2=8c+bc$

$8c=b \quad bc=2 \quad c=\frac{b}{8} \quad b\times\frac{b}{8}=2$

$8a+b=0 \quad 8a=-b \rightarrow a=\frac{-b}{8} \quad \frac{b^2}{8}=2$

$\frac{ab}{c}=\frac{\frac{-b}{8}\times b}{\frac{b}{8}}=-b \longrightarrow b=\pm 4 \quad b^2=16$

$b=\pm 4$

$f=\{(-1,2),(2,4),(3,-2),(0,\frac{1}{2})$ (۷

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

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

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

(۸

$a-3b=c \rightarrow -1-3(-2)=0 \rightarrow c=+0$

$2a-2b=1 \rightarrow 2(-1)-2b=1 \rightarrow -2b=4 \rightarrow b=-2$

$a=d=-1 \quad d+c=-1+0=2$

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

$\hookrightarrow \frac{1}{4}$

$-\sqrt{(x-\frac{1}{2})^2} \rightarrow -|x-\frac{1}{2}| = b$

$-a + \frac{1}{2} = b \rightarrow a + b = \frac{1}{2}$

$x^2 + 2x + b = 0 \quad b = 9 \rightarrow c = -4$ (10

$\hookrightarrow x = 1$ جذر

$\frac{2}{1-(-3)} = \frac{\textcircled{2} \rightarrow 8 = 2x + 9}{14}$

$2 \times 1 + a = 8$

$a = 6$

$a + b + c = 6 + 9 + -4 = 12$

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