

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱ کلاس ریاضیات
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الف) $F(x) = \sqrt{x|x|} \rightarrow x|x| \geq 0 \rightarrow \begin{cases} \text{✓} \\ \text{✗} \end{cases} D_F = [0, +\infty) \quad g(x) = x \quad D_g = \mathbb{R}$ دایره مساوی نمی باشند

ب) $F(x) = \frac{(x^2+1)(x+1) + x + 1}{x^2 + \omega x + 1} \rightarrow \Delta = b^2 - 4ac \rightarrow 2\omega - 2\omega = -1^2 \rightarrow \Delta = -1 < 0 \rightarrow D_F = \mathbb{R} \quad D_g = \mathbb{R}$ دایره مساوی هستند

ج) $F(x) = \frac{x \sin^2 x - 4 \sin x}{x \sin x - 2} \rightarrow \begin{cases} x \sin x - 2 \neq 0 \rightarrow x \sin x \neq 2 \rightarrow -2 < x \sin x < 2 \rightarrow D_F = \mathbb{R} \\ x \sin x - 2 = 0 \rightarrow x \sin x = 2 \end{cases} D_g = \mathbb{R}$ دایره مساوی هستند

د) $F(x) = \frac{x}{x \pm 0}, g(x) = \frac{|x|}{x} \rightarrow x \neq 0 \quad D_F = \mathbb{R} - \{0\} \quad D_g = \mathbb{R} - \{0\}$ دایره مساوی هستند

الف) $F(x) = \left[\frac{x^2}{x^2+1} \right] \rightarrow D_F = \mathbb{R}, \quad g(x) = [x - [x]] \rightarrow D_g = \mathbb{R}$ دایره مساوی هستند

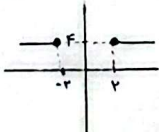
ب) $F(x) = \frac{1}{[x]} \rightarrow x \in \mathbb{Z} \rightarrow x \neq 0 \rightarrow D_F = \mathbb{Z} - \{0\} \quad g(x) = \frac{1}{x} \rightarrow x \neq 0 \rightarrow D_g = \mathbb{R} - \{0\}$ دایره مساوی هستند

ج) $F(x) = \frac{1}{\sqrt{x-1|x|}} \rightarrow x-1|x| > 0 \rightarrow x > |x| \rightarrow D_F = \emptyset \quad g(x) = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow x > 0 \rightarrow D_g = \mathbb{R} - \{0\}$ دایره مساوی هستند

د) $F(x) = \begin{cases} \frac{x^2-x}{x-1} & x \neq 1 \\ 2 & x = 1 \end{cases} \rightarrow D_F = \mathbb{R} \quad g(x) = x^2 + x \rightarrow D_g = \mathbb{R}$ دایره مساوی هستند

$F(x) = x^2 - x + 1 + g(x)$
 $F(x) = x^2 + x + 1 - g(x)$
 $2F(x) = 2x^2 + 2 \rightarrow F(x) = x^2 + 1, g(x) = x$
 $F(x) - g(x) = x^2 + 1 - x = x^2 - x + 1$

$F(x) = x - \sqrt{x^2 - 4} \rightarrow x^2 - 4 \geq 0 \rightarrow x^2 \geq 4 \rightarrow x \geq 2 \text{ یا } x \leq -2$
 $F(x) = x + \sqrt{x^2 - 4} \rightarrow x^2 - 4 \geq 0 \rightarrow x \geq 2 \text{ یا } x \leq -2$
 $F \times g \rightarrow D_F \cap D_g = (-\infty, -2] \cup [2, +\infty)$
 $(x+y)(x-y) = x^2 - y^2 = x^2 - x^2 + 4 = 4$



$g(x) = \frac{a-b}{x^2 - px - a} \quad F(x) = \frac{ax+p}{x^2 - mx + n}$
 $-r = pm \rightarrow m = \frac{p}{r} \quad -a = rn \rightarrow n = \frac{-a}{r} \quad -b = p \rightarrow b = -p \quad \frac{1}{r} = a$
 $am - bn \Rightarrow \left(\frac{1}{r} \times \frac{p}{r}\right) - \left(-\frac{p}{r} \times \frac{-a}{r}\right) = \frac{p}{r^2} - \frac{pa}{r^2} = \frac{p(1-a)}{r^2}$

$f(x) = \frac{bx+r}{ax+b} \quad g(x) = c \quad dg = R - \sum a_i x_i$ $\frac{bx+r}{ax+b} = \frac{c}{1} \rightarrow bx+r = axc+bc \rightarrow \begin{cases} axc = bx \rightarrow b = ac \\ bc = r \end{cases} \Rightarrow ac \times c = ac^2 = r \rightarrow c^2 = \frac{r}{a} \rightarrow c = \pm \sqrt{\frac{r}{a}}$ $c \rightarrow \frac{1}{r} \rightarrow b = r \quad ax+rx=0 \rightarrow ax = -r \rightarrow x = -\frac{r}{a} = a \quad \checkmark \quad \frac{ab}{c} = \frac{\frac{1}{r} \times r}{\frac{1}{r}} = \frac{1}{\frac{1}{r}} = r = -r \quad c = \pm \frac{1}{r}$ $c \rightarrow -\frac{1}{r} \rightarrow b = -r \quad ax-rx=0 \rightarrow ax = r \rightarrow x = \frac{r}{a} = a \quad \checkmark \quad \frac{ab}{c} = \frac{\frac{1}{r} \times -r}{-\frac{1}{r}} = \frac{-1}{-\frac{1}{r}} = r = -r$	f
$f(x) = \{(x, y), (y, f(x)), (x, -f(x)), (0, \frac{1}{x})\} \quad g(x) = \{(x, f), (x, g), (-1, -f), (1, 0)\}$ $fg(x) = \{(x, 1), (x, 1/r), (-1, -1), (1, 0)\}$ $\frac{fg}{f+g} \Rightarrow (-1, f), (x, 1), (x, r) \Rightarrow p = f, 1/r$ $\hookrightarrow (-1, -r), (x, 1), (x, r)$	y
$g = \{(x, 1), (x, 1), (a-rb, a)\} \quad f = \{(x, a), (-x, ra-rb), (c, a), (x, d)\}$ $a = -1 \quad ra-rb = 1 \rightarrow -r-rb = 1 \rightarrow rb = -r \rightarrow b = -1$ $d = -1 \quad a-rb = c \rightarrow -1+4 = c \rightarrow c = 3$ $d+c \Rightarrow -1+3 = 2$	A
$f(x) = \sqrt{-x^2 + x - m} \quad g(x) = \{(a, b)\}$ $-x^2 + x - m \rightarrow \Delta = b^2 - 4ac = 1 - 4m = 0 \rightarrow 4m = 1 \rightarrow m = \frac{1}{4}$ $-x^2 + x - \frac{1}{4} \quad x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{-1 \pm 0}{-2} = \frac{1}{2} = x = a$ $-\frac{1}{4} + \frac{1}{4} - \frac{1}{4} = \frac{-1-1+1}{4} = \frac{-1}{4} = 0 = b \quad \checkmark \quad a+b = \frac{1}{2} + 0 = \frac{1}{2}$	q
$f(x) = \frac{rx+a}{x^2+4x+b} \quad g(x) = \frac{r}{x-c}$ $(x+r)^2 = x^2+4x+9 \rightarrow \boxed{b=9}$ $(x-c)^2 = x^2+4x+9 \rightarrow (x+\frac{r}{x})^2 \rightarrow \boxed{c=-r}$ $a+b+c = 9+9-r = 18$ $\frac{rx+a}{(x+r)(x+r)} = \frac{r}{x+r} \rightarrow (x+r)(rx+a) = r(x+r)(x+r)$ $rx+a = rx+9 \rightarrow \boxed{a=9}$	1.