

نام و نام خانوادگی سروش اخوان پاسخنامه تشریحی تکلیف شماره ۸... کلاس ۱۰م... پیر B

الف) $f(x) = \sqrt{x+1}$, $g(x) = x$ $x+1 \geq 0 \Rightarrow D_f = [-1, +\infty)$

$D_g = \mathbb{R} \Rightarrow D_f = D_g = \mathbb{R}$ این تابع برابر نیست $\Rightarrow D_f \neq D_g \Rightarrow$ برابر نیست

ب) $f(x) = \frac{(x+3)(x+1)+x+4}{x^2+8x+15}$, $g(x) = \frac{x^2+8x+15}{x^2+8x+15}$ $\Rightarrow f(x) = 1, g(x) = 1$

ج) $f(x) = \frac{2 \sin x (2 \sin x - 2)}{2 \sin x - 2}$, $g(x) = 2 \sin x$ $\Rightarrow f(x) = 2 \sin x, g(x) = 2 \sin x$ برابر نیست

همیشه برقرار است $\Rightarrow \sin x \neq 1, 2 \sin x \neq 2 \Rightarrow 2 \sin x - 2 \neq 0$

د) $D_f = D_g = \mathbb{R} - \{0\}$ جواب این تابع به ازای همه مقادیر برابر است و صفر تعریف نشده می شود

الف) $f(x) = \left[\frac{x^2}{x^2+1} \right]$, $g(x) = [x - [x]]$ $\Rightarrow$ دو تابع به ازای همه مقادیر صفری شوند

$\Rightarrow D_f = D_g = \mathbb{R}$ برابر نیست $\Rightarrow D_f \neq D_g \Rightarrow$ برابر نیست

ب) $f(x) = \frac{1}{[x]}$, $g(x) = \frac{1}{x - [x]}$ $\Rightarrow D_g \Rightarrow x - [x] \neq 0 \Rightarrow [x] \neq x \Rightarrow D_g = \mathbb{R} - [0, 1)$

ج) $|x| - x > 0 \Rightarrow x > |x| \Rightarrow D_f = \emptyset$ برابر نیست $\Rightarrow D_f \neq D_g \Rightarrow$ برابر نیست

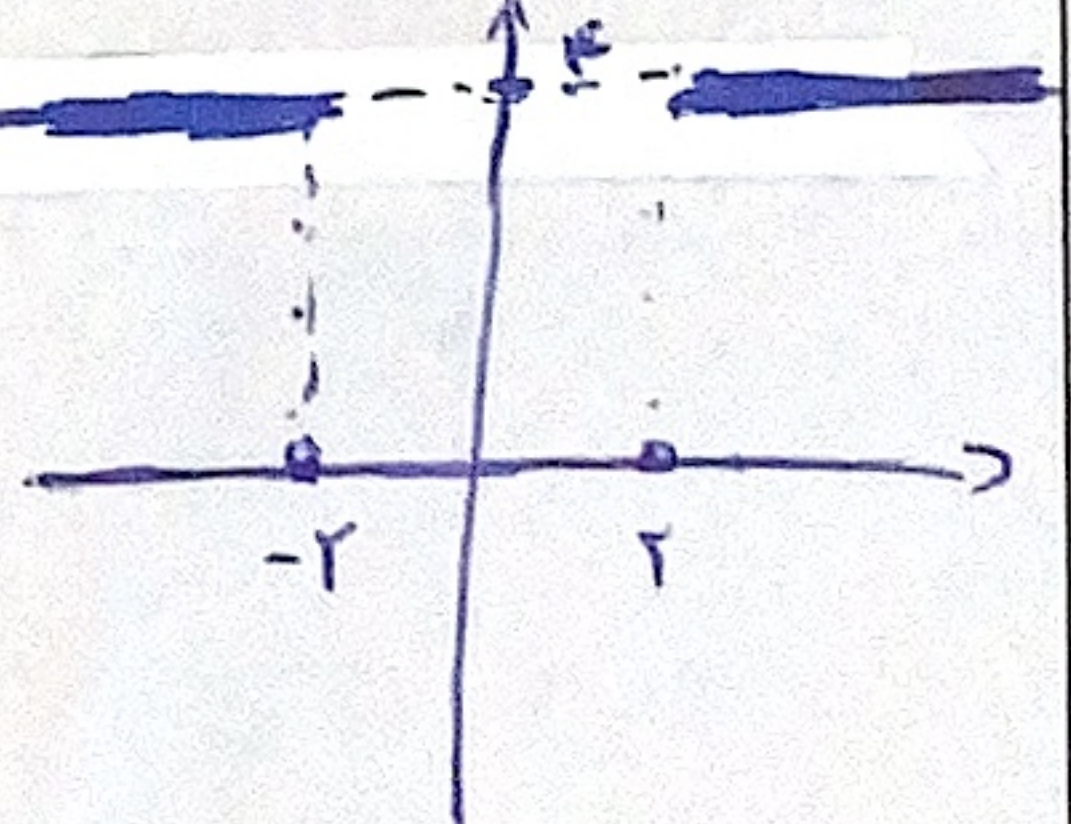
د) $f(x) = \begin{cases} \frac{x^2-1}{x-1} & x \neq 1 \\ 2 & x = 1 \end{cases}$ $x(x^2-1) = x(x+1)(x-1) = x^2+x$

$\Rightarrow f(x) = x^2+x, g(x) = x^2+x$ دو تابع برابر نیست

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

$\Rightarrow g(x) = x$ $\Rightarrow f'(x) - g'(x) = 2x + 1$

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

$\sqrt{x^2-4} \geq 0 \Rightarrow x^2-4 \geq 0 \Rightarrow x^2 \geq 4 \Rightarrow x \geq 2$ 

$\Rightarrow D(f \circ g) = \mathbb{R} - (-2, 2) \cup (-\infty, -2] \cup [2, +\infty)$

الف) $f(x) = \frac{x-b}{2x^2-2x-8}$, $g(x) = \frac{ax+c}{x^2-mx+n}$ $\times \frac{2}{2}$

صورت ها به هم برابر باشند

$\Rightarrow \frac{x-b}{2x^2-2x-8} = \frac{2ax+c}{2x^2-2mx+2n}$ $x = 2ax \Rightarrow a = \frac{1}{2}$

$2x^2-2x-8 = 2x^2-2mx+2n \Rightarrow -2 = -2m \Rightarrow m = \frac{2}{2} = 1, -8 = 2n \Rightarrow n = -\frac{8}{2} = -4$

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

$\Rightarrow am - bn = \left(\frac{1}{2} \times \frac{2}{2}\right) - (-\frac{8}{2} \times 1, 8) = \frac{1}{2} - 1 = -\frac{1}{2}$

$\frac{bx+r}{\Lambda x+b} = c \quad bx+r = \Lambda cx + bc \Rightarrow bc = r, bx = \Lambda cx$ $\Rightarrow b = \Lambda c \quad , b = \frac{r}{c} \Rightarrow c^2 = \frac{1}{r} \Rightarrow c = \pm \frac{1}{\sqrt{r}}$ $\Rightarrow b = \sqrt{r}, -\sqrt{r}$ $\Lambda x + b \neq 0 \quad \Lambda x \neq -b \Rightarrow x \neq -\frac{b}{\Lambda} \quad , a = \frac{r}{\Lambda} = \frac{1}{r} \Rightarrow \left(\frac{ab}{c} = \sqrt{r}, -\sqrt{r} \right)$	6
$f = \{(r, 1), (r, r), (r, -r), (0, \frac{1}{r})\}$ $g = \{(r, r), (r, r), (-1, -r), (0, 0)\}$ $\Rightarrow \frac{fg}{f+g} = \{(r, 1), (r, r), (-1, r)\}$ $\Rightarrow \{1, r, r\} = \mathcal{E} \cdot \mathcal{F}$	7
$f = \{(r, a), (-r, ra - rb), (c, d), (r, d)\}$ $g = \{(r, -1), (-r, 1), (a - rb, r)\}$ $a = d = (-1) \quad ra - rb = 1 \Rightarrow -r - rb = 1$ $\Rightarrow rb = -r \Rightarrow b = -1 \quad a - rb = c \Rightarrow -1 + r = d$ $\Rightarrow d + c = -1 + r = \boxed{r}$	8
$u^r = u + m \sqrt{r}$ $b^r = \varepsilon ac = 1 - \varepsilon m = 0 \Rightarrow b \neq \frac{1}{r} \Rightarrow \Delta = 0$ $, m = \frac{1}{r} \left\{ \begin{array}{l} u^r = u + \frac{1}{r} = 0 \Rightarrow (u - \frac{1}{r})^r = 0 \\ \Rightarrow u = \frac{1}{r} \quad , f(u) = 0 \end{array} \right.$ $a + b = \frac{1}{r} + 0 = \boxed{\frac{1}{r}}$	9
$f(x) = \frac{rx+a}{u^r+9u+b} = g(x) = \frac{r}{u-c} = f(x) = \frac{rx+a}{(\frac{au+\frac{a}{r}}{r})(u-c)} \Rightarrow Pf = R - \left\{c, -\frac{a}{r}\right\}$ $Pg = R - \{c\} \quad f(x) = g(x) \Rightarrow Pf = Pg \Rightarrow c = \boxed{-\frac{a}{r}}$ $r(u+a)(u-c) = ru^r + ru + rb \Rightarrow ru^r + (a-rc) = -ac$ $= ru^r + ru + rb \Rightarrow a - rc = 1r \Rightarrow \boxed{a = 1r + rc} \quad \boxed{a+b+c = 1r}$	10

$$-ac - rb \Rightarrow b = \frac{-ac}{r} = \frac{-rc^2 - 1rc}{r} \Rightarrow b = c^2 - rc, a = -rc = rc + 1r$$

$$\Rightarrow -rc = 1r \Rightarrow \boxed{c = -\frac{1}{r}} \quad a+b+c = (rc+1r) + (-c^2-rc) + c = 1r$$