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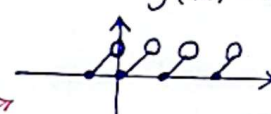
نام و نام خانوادگی: علی رضا اسن عسری پاسخنامه تشریحی تکلیف شماره ۸۰۰ کلاس ۵۰۰ هم B

الف) $x|x| \geq 0 \Rightarrow D_f = [0, +\infty)$ دامنه ها برابر است پس تابع نیست ✓
 $g(x) = x \Rightarrow D_g = \mathbb{R}$

ب) $x^2 + 5x + 7 \neq 0 \Rightarrow \Delta = b^2 - 4ac = 25 - 28 = -3$ ریشه ندارد ✓
 $D_f = \mathbb{R}, D_g = \mathbb{R}$

ج) $2\sin x - 3 \neq 0 \Rightarrow 2\sin x \neq 3 \Rightarrow \sin x \neq \frac{3}{2}$ همواره برقرار ✓
 $D_f = \mathbb{R}$
 $D_g = \mathbb{R}$

د) $D_f = \mathbb{R} - \{0\}$ با عددگذاری ✓
 $D_g = \mathbb{R} - \{0\}$ $f(x) = g(x)$ برابر است ✓

الف) $f(x) = \left[\frac{x^2}{x^2+1} \right]$ $f(x) = 0$ است
 $P_f = P_g = \mathbb{R}$ $g(x) = [x - [x]]$ $g(x) = 0$ برابر است ✓


ب) $D_f = \mathbb{R} - [0, 0.5)$ $D_g = \mathbb{R} - [0, 1)$ برابر نیستند ✓

ج) $D_f = \emptyset$ $D_g = (-\infty, 0)$ برابر نیستند ✓

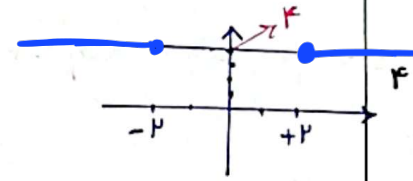
د) $\frac{x^3 - x}{x-1} = \frac{x(x^2-1)}{x-1} = \frac{x(x-1)(x+1)}{x-1} = x(x+1)$ برابر است ✓
 $g(x) = x^2 + x$

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

$Dg = Df = x^2 - 4 \geq 0 \rightarrow -2 \leq x \leq 2 = [-2, 2]$

$f \times g = (x - \sqrt{x^2 - 4})(x + \sqrt{x^2 - 4}) = x^2 - x^2 + 4 = 4$ ✓ $\rightarrow 1, 5$

$D_f = D_g = \mathbb{R} - (-2, 2)$



$f(x) = \frac{2(ax+2)}{2(x^2-mx+n)} = \frac{2ax+4}{2x^2-2mx+2n} \rightarrow a = \frac{1}{2}, b = -4$

$2ax^2 - 2mx + 2n = 2x^2 - 2x - 8$

$am - bn = (\frac{1}{2} \times \frac{3}{2}) - (-\frac{4}{2} \times -\frac{5}{2}) = \frac{3}{4} - \frac{10}{2} = -\frac{17}{4}$ جواب ✓

$\rightarrow n = \frac{3}{2}$
 $\rightarrow n = -\frac{5}{2}$

$$\frac{bx+r}{\lambda x+b} = c \rightarrow bx+r = \lambda cx + bc \rightarrow bc = r$$

$$bx = \lambda cx \rightarrow b = \lambda c \rightarrow c = \frac{b}{\lambda}$$

$$\left. \begin{aligned} & b\left(\frac{b}{\lambda}\right) = r \rightarrow b^2 = \lambda r \\ & \left\{ \begin{aligned} b=r &\rightarrow c = \frac{1}{r} \\ b=-r &\rightarrow c = -\frac{1}{r} \end{aligned} \right. \end{aligned} \right\} \begin{aligned} & a = -\frac{1}{r} \\ & a = \frac{2}{r} \end{aligned}$$

$$\Rightarrow \frac{ab}{c} = \boxed{\pm r}$$

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

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

$$f = \left\{ (r, a), (-r, ra-rb), (c, d), (r, d) \right\}$$

$\downarrow$ $\downarrow$ $\downarrow$
 -1 a -1

$$g = \left\{ (r, -1), (-r, 1), \left(\frac{a-rb}{a}, d \right) \right\}$$

$a = -1$ $\frac{-1}{a}$

$$ra-rb=1 \rightarrow b=-r$$

$$d+c = \boxed{r}$$

$$-(x^r - x + m) \geq 0 \rightarrow m^r - x + m \leq 0 \xrightarrow[\text{مربع كامل}]{\text{تبين}} \left(x - \frac{1}{r}\right)^r \leq 0 \rightarrow x = \frac{1}{r}$$

$$f\left(\frac{1}{r}\right) = 0$$

$$a = \frac{1}{r}, b = 0 \rightarrow \boxed{a+b = \frac{1}{r} + 0 = \frac{1}{r}}$$

$$f(x) = \frac{px+a}{x^r+qx+b}, \quad g(x) = \frac{r}{x-c}$$

$\xrightarrow{\text{رشيء مضاعف}}$

$$a+b+c = 4+9-r = \boxed{12} \quad a \neq c$$

$$x^r + qx + b = (x+r)^r \rightarrow \boxed{b=9}$$

$$\frac{px+a}{(x+r)^r} = \frac{r}{x-c} \xrightarrow{a=4}$$

$$\frac{r(x+r)}{(x+r)^r} = \frac{r}{x-c} \Rightarrow \boxed{c = -r}$$