

۱۲، ۲۵

کیمیای برادی
تکلیف شماره ۸

۱۱۵

الف) $f(x) = \sqrt{x|x|}$ و $g(x) = x$
 $\downarrow$
 $\sqrt{x^2} = |x| \begin{cases} x \geq 0 \rightarrow x \\ x < 0 \rightarrow -x \\ x = 0 \rightarrow 0 \end{cases}$

$D_f \neq D_g$

ب) $f(x) = \frac{x^2 + 1}{x^2 + 1} \cdot x + 1$ و $g(x) = 1$
 طایفه ها یکسان و دامنه ها یکسان ✓

$x^2 + 1 \cdot x + 1 \Rightarrow \frac{x^2 + 1x + 1}{x^2 + 1x + 1} = 1$

ج) $f(x) = \frac{p \sin^2 x + q \sin x}{p \sin x - p}$ و $g(x) = p \sin x$

$\frac{p \sin x (p \sin x - p)}{p \sin x - p} = p \sin x$ ✓

$\Delta < 0 \leftarrow \frac{p \sin x - p}{p \sin x - p} \rightarrow \sin x \leq 1 \rightarrow \frac{-p}{p} \leq p \sin x \leq \frac{p}{p}$

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

$|x| \rightarrow \begin{cases} x > 0 \rightarrow \frac{x}{|x|} = 1 \\ x < 0 \rightarrow \frac{x}{-x} = -1 \end{cases}$

~~دامنه ها یکسان نیست~~

ه) $f(x) = \left[\frac{x^r}{x^r + 1} \right]$ و $g(x) = [x - [x]]$

$x^r + 1 > x^r \rightarrow 0$

$x \geq [x]$ ✓

$D_f = D_g$

و) $f(x) = \frac{1}{[p x]}$ و $g(x) = \frac{1}{p[x]}$

$f(x) \neq g(x)$

$[p x] \neq p[x] \rightarrow D_f \neq D_g$

ز) $f(x) = \frac{1}{\sqrt{x - [x]}}$ و $g(x) = \frac{1}{\sqrt{|x| - x}}$

$x - [x]$

$D_f = \emptyset$

$|x| - x$

$g(x) = (-\infty, 0)$

ح) $f(x) = \begin{cases} \frac{x^p - x}{p x - 1} : x \neq 1 \\ \frac{x^p - x}{p x - 1} : x = 1 \end{cases}$ و $g(x) = x^p + x$

$x \cdot x^p - 1 \rightarrow \frac{x^{p+1} - 1}{x - 1} = x^p + x$
 $D_f = D_g = \mathbb{R}$ ✓

۲-۲

$$f(x) + g(x) = x^p + x + 1$$

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

$$f'(x) - g'(x) = p(f(x) + g(x))(f(x) - g(x))$$

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

$$\frac{x^p + x^p + 1}{p}$$

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

$$p f(x) = p x^p + p \rightarrow f(x) = \frac{x^p + 1}{p}$$

$$x^{\frac{p}{2}} + 1 - g(x) = \frac{x^p}{p} + 1$$

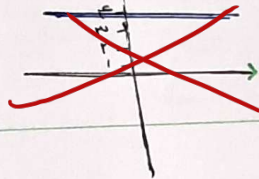
$$-g(x) = -x \rightarrow g(x) = x$$

$$[1, +\infty) \cup (-\infty, -1]$$

$$f(x) = x - \sqrt{x^p - p} \rightarrow D_f = \{x \geq p\} \cup \{x \leq -p\} \rightarrow ([p, +\infty) \cup (-\infty, -p]) \cap \mathbb{R}$$

$$g(x) = x + \sqrt{x^p - p} \rightarrow D_g = \mathbb{R} \cap ([p, +\infty) \cup (-\infty, -p]) \rightarrow$$

$$g(x) \times f(x) = (x - \sqrt{x^p - p})(x + \sqrt{x^p - p}) \rightarrow x^p - x^p + p = p$$



1/0

-5/4

$$f(x) = \frac{ax + p}{x^p - mx + n}$$

$$\frac{p}{p} - \frac{p}{p} = \frac{p}{p}$$

$$g(x) = \frac{x - b}{p x^p - p x - 1}$$

$$p x^p - p x - 1 \rightarrow (x - \frac{p}{p})(x + \frac{p}{p}) \rightarrow \frac{p}{p} - 1$$

$$m = \frac{p}{p} - 1 = \frac{p}{p}$$

$$n = \frac{p}{p} \times (-b) = -\frac{p}{p}$$

$$ax + p = x - b$$

$$a = 1, b = -p$$

0, 1, 0, 0

$$f(x) = \frac{bx + p}{ax + b} \rightarrow b = p \rightarrow f(x) = \frac{1}{p}$$

$$g(x) = c$$

$$c = \frac{1}{p}$$

$$D_g = \mathbb{R} - \{a\} \rightarrow a = -\frac{1}{p}$$

$$\frac{a \cdot b}{c} = \frac{1}{p}$$

$$\frac{-1}{p} \times p = -1$$

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

0, 1, 0

9 -7

$$f-1 = \{(-1, 1), (1, 1), (1, -1), (0, 0)\}$$

$$g = \{(1, 1), (1, 1), (-1, -1), (0, 0)\}$$

$$f = \{(1, 1), (1, 1), (1, -1), (0, 0)\}$$

$$\frac{fg}{f+g} \rightarrow \frac{\{(1, 1), (1, 1), (-1, -1), (0, 0)\}}{\{(1, 1), (1, 1), (-1, 1)\}}$$

$$R = \{1, 1, 1\}$$

$$\{(1, 1), (1, 1), (-1, 1)\} \rightarrow$$

$$f = \{(1, 1), (-1, 1), (1, 1), (1, 1)\}$$

$$g = \{(1, 1), (-1, 1), (1, 1), (1, 1)\}$$

$$a = -1$$

$$d + c = 1$$

$$-1 + a = 1$$

$$-1 - 1b = 1 \rightarrow 1 = -1b \rightarrow b = -1$$

$$a - 1b = c \rightarrow -1 + 1 = 0$$

5 -8

$$f(x) = \sqrt{-x^2 + x - m} \rightarrow D_f = a \rightarrow \sqrt{-a^2 + a - m} = b$$

$$g(x) = f(a, b)$$

$$-\sqrt{m} = b$$

$$a + b = 1$$

$$m \neq 0 \rightarrow \dots$$

-9

0

$$a = -1$$

$$m = 0$$

$$b = 0$$

$$f(x) = \frac{px + a}{x^2 + ax + b}$$

$$g(x) = \frac{p}{x - c}$$

$$a + b + c = p$$

$$\frac{px + a}{x^2 + ax + b} = \frac{p}{x - c}$$

$$x^2 + ax + b = x - c$$

$$x^2 + ax - V \rightarrow (x + V)(x - 1)$$

$$b \rightarrow c \rightarrow$$

$$\begin{cases} 1, 0 \\ p, 1 \\ 1, 1 \\ -1, V \end{cases}$$

$$\frac{p}{x + V} = \frac{p(x - 1)}{(x + V)(x - 1)}$$

$$\begin{cases} c = -V \\ b = -1 \\ a = -p \end{cases}$$

$$\rightarrow \dots$$

0

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