

الف) $f(x) = \sqrt{|x|}$ $|x| \geq 0$ $g(x) = x \Rightarrow x$ مساوی نیستند
 $D_f = [0, +\infty)$ $D_g = \mathbb{R}$

ب) $f(x) = \frac{x^2 + 4x + 3 + x + 4}{x^2 + 5x + 6} = \frac{x^2 + 5x + 7}{x^2 + 5x + 6} = 1$ $g(x) = 1 \Rightarrow \sqrt{\text{مساوی هستند}}$
 $D_f = \mathbb{R}$ $D_g = \mathbb{R}$

ج) $f(x) = 2\sin x - 2 \neq 0$ $\checkmark \sin x \neq \frac{1}{2}$ $D_f = \mathbb{R}$ $2\sin x = 2 \Rightarrow D_g = \mathbb{R} \Rightarrow \checkmark$ مساوی هستند

د) $\frac{x}{|x|} = \frac{|x| \neq 0}{x \neq 0}$ $D_f = \mathbb{R} - \{0\}$, $D_g = \mathbb{R} - \{0\} \Rightarrow \checkmark$ مساوی هستند

۱۲) الف) $\left[\frac{x}{x+1}\right]$ $\frac{x^2+1 \neq 0}{x^2 \neq -1 \checkmark}$ $\left[\frac{x}{x+1}\right] = 0$, $\left[x - \left[\frac{x}{x+1}\right]\right] = 0$
 $\mathbb{R} \Rightarrow$ جواب $[0, 1) \Rightarrow$ پس همیشه $\checkmark$ مساوی هستند

ب) $\frac{1}{[2x]}$ $2x \neq 0$ $D_f = \mathbb{R} - [0, \frac{1}{2})$ $\frac{1}{[x]}$ $[x] \neq 0$ برابر نیستند
 $D_f = \mathbb{R} - [0, 1)$ $D_g = \mathbb{R} - [0, 1)$

ج) $\frac{1}{\sqrt{x-x^2}}$ $D_f = \emptyset = \mathbb{Q}$ $\frac{1}{\sqrt{|x|-x}}$ $D_f = (-\infty, 0) \Rightarrow \checkmark$ مساوی نیستند
 $\neq \emptyset$ $\neq \emptyset$

د) $D_f = \mathbb{R}$ $D_g = \mathbb{R}$ $\checkmark$ مساوی هستند

$f(x) + g(x) = x^2 + x + 1$ $f'(x) - g'(x) = (x^2+1)' - x^2$ ۱۳
 $f(x) - g(x) = x^2 - x + 1$
 $2f(x) = 2x^2 + 2$
 $f(x) = x^2 + 1 \Rightarrow g(x) = x$
 $x^2 + 2x^2 + 1 - x^2 = x^2 + x^2 + 1$

$f(x) = x - \sqrt{x^2 - 4}$ $f \cdot g = (x - \sqrt{x^2 - 4})(x + \sqrt{x^2 - 4}) = x^2 - x^2 + 4 = 4$ ۱۴
 $g(x) = x + \sqrt{x^2 - 4}$
 $D_f = D_g = (-\infty, -2] \cup [2, +\infty)$

$f(x) = \frac{ax+b}{x^2-mx+n}$ $g(x) = \frac{x-b}{x^2+px-d}$ $f(x) = g(x)$ ۱۵

$g(x) \rightarrow 2x^2 - 4x - 4 \neq 0$ $(2x-4)(x+1) \neq 0 \rightarrow x \neq \frac{2}{1}$ $\neq -1$ $D_g = \mathbb{R} - \left\{\frac{2}{1}, -1\right\}$
 $f(x) \rightarrow (x+1)(x-\frac{4}{2}) \rightarrow m = \frac{4}{2}$ $n = -\frac{4}{2}$ $2ax + 4 = x - b \rightarrow x = 0$ $4 = -b$
 $2a + 4 = 0 \Rightarrow a = -\frac{4}{2}$ $am - bn = -\frac{4 \cdot 4}{2}$ $b = -4$

$$f(x) = \frac{bx+r}{\lambda x+b}$$

$$g(x) = c$$

$$p_g = 11 - \{a\}$$

$$p_f = 11 - \left\{ \frac{-b}{\lambda} \right\}$$

$$p_g = p_f$$

$$a = \frac{-b}{\lambda} \Rightarrow b = -\lambda a$$

$$\frac{-\lambda a x + r}{\lambda x - \lambda a}$$

$$\xrightarrow{x=0} \frac{r}{-\lambda a} = c$$

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

$$\frac{ab}{c} = \pm \varepsilon \Rightarrow \frac{\frac{1}{\varepsilon} x - \varepsilon}{-\frac{1}{\varepsilon}} = \pm \varepsilon$$

$$-\frac{1}{\varepsilon} x \varepsilon = \pm \varepsilon$$

$$x=1$$

$$\frac{-\lambda a + r}{\lambda - \lambda a} = \frac{-1}{\varepsilon a} = c$$

$$\lambda a - \lambda = -\lambda^2 a^2 + \lambda a$$

$$\Rightarrow a^2 = \frac{1}{\varepsilon} \Rightarrow \frac{1}{\varepsilon}$$

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

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

$$\frac{f \circ g}{f+g} = \{(\frac{1}{\varepsilon}, 1), (1, 1), (-1, \varepsilon)\}$$

$$f = \{(1, \frac{1}{\varepsilon}), (-1, \frac{1}{\varepsilon} - \frac{1}{\varepsilon}), (c, 0), (1, \frac{1}{\varepsilon})\} = \frac{a=b}{\text{علاقة}}$$

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

$$-1 - \frac{1}{\varepsilon} = 1 \quad b = -1$$

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

$$-1 + \frac{1}{\varepsilon} = 0$$

$$a + c = -1 + 0 = -1$$

$$-(x^2 - x + m) \geq 0 \Rightarrow \Delta = 0$$

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$$\sqrt{-(x-a)^2}$$

$$p_f = p_g = \{a\}$$

$$-x^2 + 2ax - a^2 = -x^2 + x - m$$

$$-a^2 = -m$$

$$m = \frac{1}{\varepsilon}$$

$$2a = 1 \quad a = \frac{1}{2}$$

$$b = 0$$

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

$$f(x) = \frac{rx + a}{x^2 + 4x + 9}$$

$$g(x) = \frac{r}{x - \frac{1}{\varepsilon}} - \frac{1}{\varepsilon}$$

$$a + b + c = 11$$

$$4 + 9 - 1 = 11$$

$$\frac{r(x + \frac{a}{r})}{(x + \frac{1}{\varepsilon})(x + \frac{1}{\varepsilon})} \quad a = 4$$