

۱) $x|x| \geq 0 \quad x \geq 0$ دامنه کیمیا نیست $\checkmark$ $R \setminus \{0\}$

۲) $f(x) = \frac{x^4 + 4x^3 + 3x^2 + x + 1}{x^2 + 5x + 7}$ $g(x) = 1$ فردی باشد از یکدیگر متساوی $\checkmark$

۳) $f(x) = 2 \sin x$ $g(x) = \sin x$ $\checkmark$ دایره برابرند

۴) $f(x) = \frac{x}{|x|}$ $x \neq 0$ $R \setminus \{0\}$ $g(x) = \frac{|x|}{x}$ $x \neq 0$ $R \setminus \{0\}$ $\checkmark$ دامنه برابرند اگر عدد از راستی کمتر برابر است

۱) $[1 - \frac{1}{2^{x+1}}]$ $D_f = R$ $g(x) = [x - [x]]$ $D_g = R$ جواب دو همیت لغز $\checkmark$ برابرند

۲) $\frac{1}{[x]}$ $x \in [0, \frac{1}{2})$ $R \setminus [0, \frac{1}{2})$ $g(x) = \frac{1}{2[x]}$ $R \setminus [0, \frac{1}{2})$ $\checkmark$ برابر نیست $\checkmark$

۳) $\frac{1}{\sqrt{x-1}}$ $x-1 > 0 \Rightarrow x > 1$ $D_f = \emptyset$ $\frac{1}{\sqrt{x-1}}$ $|x-1| > 0$ $|x| > 1$ $\checkmark$ برابر نیست $\checkmark$

۴) $\frac{x(x+1)(x-1)}{x-1} = x^2 + x$ $\checkmark$ این دو تابع برابرند $f(x) = g(x)$ $\checkmark$ دامنه برابر $\checkmark$

$(f(x) - g(x))(f(x) + g(x)) = f^2(x) + fg(x) - fg(x) - g^2(x)$

$(x^2 - x + 1)(x^2 + x + 1) = x^4 + x^2 + x^2 - x^2 - x^2 - x + x + 1 = x^4 + x^2 + 1 = f^2(x) + g^2(x)$

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

$g(x) = x$ $\checkmark$

$x^2 - 4 \geq 0 \quad x \geq 2 \quad D_f = (-\infty, -2] \cup [2, +\infty)$

$x^2 \geq 4 \quad x \leq -2$

$g(x) \times f(x) = (x + \sqrt{x^2 - 4})(x - \sqrt{x^2 - 4}) = (a+b)(a-b) = a^2 - b^2$

$x^2 - (x^2 - 4) = x^2 - x^2 + 4 = 4 \Rightarrow f(x) \times g(x) = 4$

شکل با توجه به دامنه علامت - علامت برابر دامنه تابع $f \times g$ بایدی به شود

$g(x) = \frac{x-b}{2x^2 - 3x - 5}$ $\rightarrow x^2 - 3x - 5$ $\frac{x^2 - 3x - 5}{(x-5)(x+1)}$ $\frac{x}{x} = -1$

$\frac{x-b}{2(x^2 - mx + n)} = \frac{ax + 2}{x^2 - mx + n}$ $\frac{1}{2}(x-b) = ax + 2$ $\frac{1}{2}x - \frac{1}{2}b = ax + 2$ $am - bn = 0, 1.5 - 1.5 = -2, 1.5$

$n = \frac{5}{2} \quad m = 1.5$

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

$ax = \frac{1}{2}x \quad a = \frac{1}{2} \quad -\frac{1}{2}b = 2 \Rightarrow b = -4$

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

$$bx + \frac{1}{x} = c \Rightarrow bx + \frac{1}{x} = c(1x + b)$$

$$b = 1c$$

$$cb = \frac{1}{x}$$

$$1 = c(1c)$$

$$\Rightarrow 1 = 1c^2 \Rightarrow c^2 = \frac{1}{x} \Rightarrow c = \pm \frac{1}{\sqrt{x}}$$

$$c = \frac{1}{\sqrt{x}} \quad b = \frac{1}{x} \rightarrow a = -\frac{1}{\sqrt{x}}$$

$$c = -\frac{1}{\sqrt{x}} \quad b = -\frac{1}{x} \rightarrow a = \frac{1}{\sqrt{x}}$$

$$\frac{ab}{c} = \left(\frac{1}{\sqrt{x}}\right) \times \left(\frac{1}{x}\right) = -\frac{1}{x}$$

$$\frac{ab}{c} = \left(\frac{1}{\sqrt{x}}\right) \times \left(-\frac{1}{x}\right) = -\frac{1}{x}$$

$$a = -\frac{b}{x}$$

$$\frac{ab}{c} \in \left\{ \frac{1}{x}, -\frac{1}{x} \right\}$$

$$2f(x) - 1 = y \Rightarrow f(x) = \frac{y+1}{2}$$

$$\Rightarrow 2f(-1) - 1 = 3 \Rightarrow f(-1) = 2$$

$$2f(2) - 1 = 4 \Rightarrow f(2) = \frac{5}{2}$$

$$2f(3) - 1 = -5 \Rightarrow f(3) = -2$$

$$2f(0) - 1 = 1 \Rightarrow f(0) = 1$$

$$f = \{(-1, 2), (2, \frac{5}{2}), (3, -2), (0, 1)\}$$

$$g = \{(2, \frac{5}{2}), (3, -2), (-1, 2), (0, 1)\}$$

$$x = -1 \quad \frac{2g}{f+g} = \frac{-5 \times 2}{2+5} = -\frac{10}{7}$$

$$x = 2 \quad \frac{2g}{f+g} = \frac{1}{\frac{5}{2}+2} = \frac{2}{9}$$

$$x = 3 \quad \frac{2g}{f+g} = \frac{-4}{-2+5} = -\frac{4}{3}$$

$$x = 0 \quad \frac{2g}{f+g} = \frac{2}{1+1} = 1$$

$$R = \left\{ -\frac{10}{7}, \frac{2}{9}, -\frac{4}{3}, 1 \right\}$$

$$a = d = -1$$

$$3a - 2b = 1$$

$$-3 - 1 = 2b$$

$$b = -2$$

$$a - 2b = c$$

$$-1 + 4 = c$$

$$c + d = -1 - 1 = -2$$

$$d_g = \{a\} \Rightarrow d_f = \{a\}$$

$$-x^2 + x - m \geq 0$$

$$x^2 - x + m \leq 0 \Rightarrow b = 0$$

$$a + b = \frac{1}{x} + 0 = \frac{1}{x}$$

$$c = b^2 - 4ac$$

$$1 - 4m = 0$$

$$m = \frac{1}{4} \Rightarrow \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{1}{2} = x$$

$$\frac{2x + a}{x^2 + 4x + b} = \frac{2}{x - c} \Rightarrow (2x + a)(x - c) = 2(x^2 + 4x + b)$$

$$2x^2 - 2cx + ax - ac = 2x^2 + 8x + 2b$$

$$1 - 2c + a = 0 \Rightarrow a = 2c - 1$$

$$-ac = 2b \Rightarrow b = -\frac{ac}{2} = -\frac{(2c-1)c}{2} = -\frac{2c^2 - c}{2} = -c^2 + \frac{c}{2}$$

$$a + b + c = (2c - 1) + (-c^2 + \frac{c}{2}) + c = -c^2 + \frac{5c}{2} - 1$$