۱) الف) $[0, +\infty)$, R

ب) ✗

ج) ϕ , $2\sin x$ ✗

د) $x \neq 0$, $x \neq 0$ ✗

۲)

الف) $x^2 \geq 1$, $x^2 \neq -1$ ✓

ب) $(-\infty, 0] \cup [1, +\infty) \cup \{\frac{1}{2}\}$, $(-\infty, 0) \cup [1, +\infty)$ ✗

ج) ϕ , $(-\infty, 0)$ ✗

۳)

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

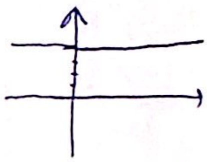
$= x^4 + x^2 + 1$

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

$f(x) - g(x) = x^2 - x + 1$ + دستگاه

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

۴) $(x - \sqrt{x^2 - 4})(x + \sqrt{x^2 + 4}) = x^2 - x^2 + 4 = 4$



۵) $\frac{ax + 2}{x^2 - mx + n} = \frac{x - b}{2x^2 - 6x - 5} \Rightarrow x^2 - mx + n = 2x^2 - 6x - 5 \Rightarrow x^2 - mx + n = x^2 - 3x - 10$

$\Rightarrow m = 3 \quad n = -10$

$ax + 2 = x - b \Rightarrow a = 1 \quad b = -2 \qquad am - bn = 3 - 20 = -17$

۶)

$8x + b \neq 0 \qquad c \neq 0 \qquad a = \frac{-b}{8}$

$x \neq \frac{-b}{8}$

(7)

ایلیا بابری

$2f-1 = \{(-1,3)(2,7)(3,-5)(0,0)\}$

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

$g = \{(2,4)(3,6)(-1,-4)(5,0)\}$

$\frac{2g}{f+g} = \{(1,8),(2,\frac{8}{11})(3,12)\}$

$2g = \{(2,8)(3,12)(-1,-8)(5,0)\}$

$f+g = \{(-1,-1)(2,11)(3,1)\}$

(8)

$a=-1$ $\quad -3-2b=1 \Rightarrow -2b=4 \Rightarrow b=-2$

$c=5$ $\quad d=-1$ $\quad 5+(-1)=4$

(9)

$-x^2+x-m \geq 0 \Rightarrow x^2-x+m \leq 0$ $\quad \Delta = 1-4m$

$\Delta = 0 \Rightarrow m=\frac{1}{4}$ $\quad x^2-x+\frac{1}{4} = (x-\frac{1}{2})^2 = 0 \Rightarrow x=\frac{1}{2}$

$a=\frac{1}{2}$ $\quad f(\frac{1}{2}) = \sqrt{-(\frac{1}{2})^2+\frac{1}{2}-\frac{1}{4}}$ $\quad \Rightarrow a+b = \frac{1}{2}+0 = \frac{1}{2}$

(10)

$\frac{2x+a}{x^2+6x+b} = \frac{2}{x-c} \Rightarrow (2x+a)(x-c) = 2(x^2+6x+b)$

$(2x+a)(x-c) = 2x^2+ax-ac-2xc = 2x^2+x(a-2c)-ac$

$x^2+6x+b = (x-c)^2 \Rightarrow x^2+6x+b = x^2-2cx+c^2 \Rightarrow 6=-2c$

$\Rightarrow a=6$

$b=9$

$c=-3$

$6+9-3=12$