

$f(x) \rightarrow x \geq 0 \rightarrow x\sqrt{x}$ (الف) $\forall(x) \rightarrow x < 0 \rightarrow$ تعریف نشده $g(x) \rightarrow D(g) = \mathbb{R}$ مساوی نیستند $(0,0)$	$D_f \rightarrow x^2 + 5x + 4$ (ب) $\Delta = b^2 - 4ac = -3$ ریشه حقیقی ندارد پس: $D_f = \mathbb{R} \rightarrow f(x) = 1 = g(x)$ برابرند	$D_f \rightarrow 2\sin x - 3 \neq 0$ (ج) $2\sin x \neq 3$ $\sin x \neq \frac{3}{2}$ $D_f = \mathbb{R} - \{\frac{3}{2}\}$ $D_g = \mathbb{R}$ برابر نیستند	$D_f \rightarrow x \neq 0$ (د) $x \neq 0$ $D_f = \mathbb{R} - \{0\}$ $D_g \rightarrow x \neq 0$ $D_g = \mathbb{R} - \{0\}$ برابرند	۱
$D_f \rightarrow x^2 + 1 \neq 0$ (الف) $x^2 \neq -1$ $D_f = \mathbb{R}$ $D_g = \mathbb{R}$ برابرند	$D_f \rightarrow [x] \neq 0 \rightarrow x \notin [0,1)$ (ب) $x \notin [0,1)$ $D_f = (-\infty, 0) \cup [1, +\infty)$ $D_g \rightarrow [x] \neq 0 \rightarrow [x] \neq 0$ $x \notin [0,1)$ $D_g = (-\infty, 0) \cup [1, +\infty)$ برابر نیستند	$D_f \rightarrow x - x \geq 0$ (ج) $D_f = (0, +\infty)$ $D_g \rightarrow x - x \geq 0$ $D_g = (-\infty, 0)$ برابر نیستند	$D_f = \mathbb{R}$ (د) $D_g = \mathbb{R}$ مساوی نیستند برابرند	۲
$f(x) + g(x) = x^2 + x + 1$ $+ f(x) - g(x) = x^2 - x + 1$ $2f(x) = 2x^2 + 2$ $f(x) = x^2 + 1$ $\downarrow$ $g(x) = x$				۳
$f(x) = x - \sqrt{x^2 - 4}$ $g(x) = x + \sqrt{x^2 - 4}$ $f \times g = ?$ $\downarrow$ $(x - \sqrt{x^2 - 4}) \times (x + \sqrt{x^2 - 4}) = x^2 - (x^2 - 4) = 4$				۴
$f(x) = \frac{ax+b}{x^2-mx+n}$ $g(x) = \frac{x-b}{x^2-3x-4}$ $am - bn$				۵

$f(x) = \frac{bx+c}{ax+b}$ $g(x) = c$ $Dg = \mathbb{R} - \{a\}$ $\frac{ab}{c} = ?$	$\frac{bx+c}{ax+b} = c$ $bx+c = c(ax+b)$ $bx+c = acx+bc$ $b = ac \rightarrow b = \pm c$ $bc = c \rightarrow (ac)c = ac^2 = c$ $c^2 = \frac{c}{a} = \frac{1}{a} \rightarrow c = \pm \frac{1}{a}$	$ax+b \neq 0 \rightarrow x \neq -\frac{b}{a} = a$ $b=c \rightarrow a = -\frac{c}{a} = -\frac{1}{a}$ $b=-c \rightarrow a = -\frac{-c}{a} = \frac{1}{a}$ $\frac{ab}{c} = \frac{(-\frac{1}{a}) \times c}{\frac{1}{a}} = \boxed{-c}$ $\frac{ab}{c} = \frac{(\frac{1}{a}) \times (-c)}{\frac{1}{a}} = \boxed{c}$	6
$x = -1 \rightarrow f(-1) = 3, g(-1) = -c \rightarrow f(-1) + g(-1) = 3 - c = 1$ $x = 2 \rightarrow f(2) = 7, g(2) = c \rightarrow f(2) + g(2) = 7 + c = 11$ $x = 3 \rightarrow f(3) = -5, g(3) = c \rightarrow f(3) + g(3) = -5 + c = 1$	$\frac{fg}{f+g} \rightarrow$ $x = -1 \rightarrow \frac{-1}{-1} = 1$ $x = 2 \rightarrow \frac{1}{11}$ $x = 3 \rightarrow \frac{12}{12} = 1$	$c \in \mathbb{R} = \{1, \frac{1}{11}, 12\}$	7
$\begin{cases} f(x) = a \\ f(x) = d \\ g(x) = -1 \end{cases}$ $\begin{cases} f(-3) = 3a - 2b \\ g(-7) = 1 \end{cases} \rightarrow 3a - 2b = 1$ $3(-1) - 2b = 1 \rightarrow -3 - 2b = 1 \rightarrow -2b = 4 \rightarrow b = -2$ $c = a - 3b \xrightarrow[b=-2]{a=-1} c = -1 - 3(-2) = -1 + 6 = 5$	$d = a = -1$ $c = a \rightarrow d + c = -1 + 5 = \boxed{4}$	8	
$f(x) = \sqrt{-x^2 + x - m}, g(x) = \{(a, b)\} \rightarrow f = g$ $-x^2 + x - m \geq 0 \rightarrow x^2 - x + m \leq 0$ $\Delta = 1 - 4m \leq 0 \rightarrow m \geq \frac{1}{4}$ $\Delta = 1 - 4m = 0 \rightarrow m = \frac{1}{4}$ $x = \frac{1}{2}$ $\{(a, b)\} = \{(0, 0)\} \rightarrow a + b = 0 + 0 = 0$	$a + b = ?$ $a = b$	9	
$f(x) = \frac{rx+a}{x^2+3x+b}, g(x) = \frac{r}{x-c}$ $\frac{rx+a}{x^2+3x+b} = \frac{r}{x-c}$ $(x+3)^2 = x^2+3x+9 \Rightarrow \boxed{b=9}$ $\frac{r(x+\frac{a}{r})}{(x+3)^2} = \frac{r}{x-c} \Rightarrow x+\frac{a}{r} = x+3$ $\frac{a}{r} = 3 \Rightarrow \boxed{a=3}$ $x+3 = x-c \Rightarrow \boxed{c=-3}$	$x^2+3x+b = (x+3)^2 = x^2+6x+9$ $a+b+c = 3+9-3 = \boxed{9}$	10	