مهم دفتر - B　　　۱۳　　　تکلیف ۸　　　باران عباسی

①　$1{,}5$

الف) $f(x) \longrightarrow D_f = [0, +\infty)$ $\longrightarrow g(x) \longrightarrow x = 3$, $D_g = R$　　برابر نیست
$.15$

ب) $f(x) \longrightarrow D_f = R$ چون مخرج ریشه حقیقی ندارد $\longrightarrow g(x) \longrightarrow D_g = R$　~~برابر نیست~~ برابر است.
$.175$
$f(2) = g(2)$　$D_f = D_g = \mathbb{R}$　$f(x) = g(x) = 1$

ج) $f(x) \to R$　$\sin x \neq \frac{3}{2}$　$g(x) \longrightarrow [-2, 2]$　$f(x) = g(x) = 2\sin x$　~~برابر نیست~~　برابر است
$.125$
$-1 \leq \sin x \leq 1 \longrightarrow D_f = D_g = \mathbb{R}$

د) $f(x), g(x) \longrightarrow D_f = g_f \longrightarrow R - \{0\}$　　برابر است
$.15$

②　2

الف) $f(x) \longrightarrow D_f = R$　　$g(x) \longrightarrow D_g = R$　　برابر است

ب) $f(x) \to (-\infty, -\frac{1}{2}] \cup [\frac{1}{2}, +\infty)$　　$g(x) \to (-\infty, 0) \cup [1, +\infty)$　　برابر نیست

ج) $f(x) \longrightarrow D_f = \varnothing$　　$g(x) = (-\infty, 0)$　　برابر نیست

د) $f(x), g(x)$　　$D_f = g_f$　　برابر است

③　$1{,}75$

$$\begin{cases} f(x) + g(x) \longrightarrow x^2 + x + 1 \\ f(x) - g(x) \longrightarrow x^2 - x + 1 \end{cases}$$

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

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

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

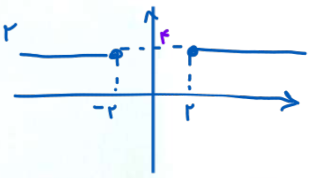
④　$.75$

$f(x), g(x) \longrightarrow (-\infty, -2] \cup [2, +\infty)$ ~~$\longrightarrow \{2, -2\}$~~
چرا اشتراک

$f(x) \times g(x) \longrightarrow \{(2,2), (-2,-2)\} \times \{(2,2), (-2,-2)\} \longrightarrow \{(2,4), (-2,4)\}$

$D_{f \times g} = x^2 \geq 4 \to x \geq 2$ یا $x \leq -2$

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



⑤　2

$(x - \frac{5}{2})(x + 1) \longrightarrow x^2 + x \cdot \frac{5}{2} x - \frac{5}{2} \longrightarrow x^2 \underbrace{- \frac{3}{2}}_{\cancel{m}} x \underbrace{- \frac{5}{2}}_{c}$

$x = 0 \longrightarrow 1 - (-2) = a + 2 \longleftarrow a = 1$
$-b = 2 \longleftarrow b = -2$

$am - bl \longrightarrow \frac{3}{2} - (-2(\frac{-5}{2})) = \cancel{-3} - \frac{1}{2}$

$m = -\frac{3}{2}$　　$n = -\frac{5}{2}$

$\frac{x - b}{2(x^2 - \cancel{\frac{3}{2}x} - \frac{5}{2})} = \frac{ax + 2}{x^2 - \cancel{mx} + n}$

$2ax + 4 = x - b$
$a = \frac{1}{2}$　,　$b = -4$

$am - bn = \frac{3}{4} - 10 = -\frac{37}{4}$

(۴)

الف) $\frac{bx+2}{8x+b}=c \longrightarrow bx+2=c(8x+b) \longrightarrow 8\times c+bc \longrightarrow b=8c \quad c=\frac{b}{8}$

$2=bc \longrightarrow 2=\frac{b^2}{8} \longrightarrow 16 \longrightarrow \pm\sqrt{16} \longrightarrow \pm 4 \to b$

ب) $c=\frac{b}{8} \longrightarrow \frac{4}{8}=\frac{1}{2}$ و $-\frac{1}{2} \longrightarrow \pm\frac{1}{2}$

ج) $8x+b=0 \longrightarrow 8a+b=0 \longrightarrow a=\frac{-b}{8} \longrightarrow b=\pm 4 \longrightarrow \pm\frac{1}{2}$

b	c	a
4	$\frac{1}{2}$	$\frac{-1}{2}$
-4	$\frac{-1}{2}$	$\frac{1}{2}$

1) $\frac{\frac{-1}{2}\times 4}{\frac{1}{2}}=-4$

2) $\frac{\frac{1}{2}\times -4}{\frac{-1}{2}}=4$

2

---

(۶)

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

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

$f+g=\{(-1,0),(2,8),(3,4)\}$

$\frac{2g}{f+g}=\{(2,\frac{8}{8}),(3,\frac{12}{4})\}$

$\longrightarrow \{(2,1),(3,3)\}$

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

1

---

(۵)

$a=-1$

$1=3a-2b \longrightarrow 1=-3-2b \longrightarrow 4=-2b \longrightarrow b=-2$

$a-3b=c \longrightarrow -1-(-6) \longrightarrow c=5$

$d=-1$

$d+c \longrightarrow -1+5=4$

2

---

(۹)

$x^2-x+m \underset{\text{ضرب}}{\leq 0}$

$x\in\left[\underbrace{\frac{1-\sqrt{1-4m}}{2}}_{L},\ \underbrace{\frac{1+\sqrt{1-4m}}{2}}_{M}\right]$

$\Delta=0 \longrightarrow 1-4m=0 \longrightarrow m=\frac{1}{4}$

$f(x)=\sqrt{-(x-\frac{1}{2})^2} \longrightarrow a=\frac{1}{2}$

همواره نامثبت است $\quad \hookrightarrow b=0$

$L+M=\frac{1-\sqrt{1-4m}+1+\sqrt{1-4m}}{2}=\frac{2}{2}=1$

0.5

---

(۱۰)

$(2x+a)(x-c)=2(x^2+6x+b)$

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

$x^2+6x+b \longrightarrow \Delta=0 \longrightarrow b=9$ $\qquad 2x^2+12x+2b$ طرف راست

$\frac{2}{x-c}=\frac{2x+a}{(x+3)^2}$ $\qquad a=12+2c$ $\qquad b=-c^2-ac$

$a+b+c=6+9-3=12$

$c=-3$ $\qquad a+b+c \longrightarrow 12-c^2-3c$

$\hookrightarrow \frac{2}{\cancel{x+3}}=\frac{2x+a}{(x+3)^{\cancel{2}}} \longrightarrow 2x+6=2x+a \longrightarrow a=6$

0.5