پاسخ‌ها

① $A\times B = \{(1,2),(1,3),(2,2),(2,3),(3,2),(3,3)\}$

$B\times B = \{(2,2),(2,3),(3,2),(3,3)\}$

$A\times B - B^2 = \{(1,2),(1,3)\}$.

② الف) $(3,m^2)(3,m+2) \to m^2 = m+2 \to m^2-m-2 \to (m-2)(m+1)$

$\to m = -1$ و 2

$m=-1$ ← قابل قبول

تابع نیست ← $(2,4)$ و $(2,2)$

$(2,1)$

ب) $(3,m)(3,m+2) \to m^2 = m+2 \to m^2-m-2 \to m = 2$ و -1

$m=2$ ← $(1,2)$ و $(2,4)$ ← تابع است

$m=-1$ ← $(3,1)$ و $(4,-1)$ ← تابع نیست

← به ازای هیچ مقدار m تابع نیست

③

$x^2-1 \xrightarrow{x=1} 0$

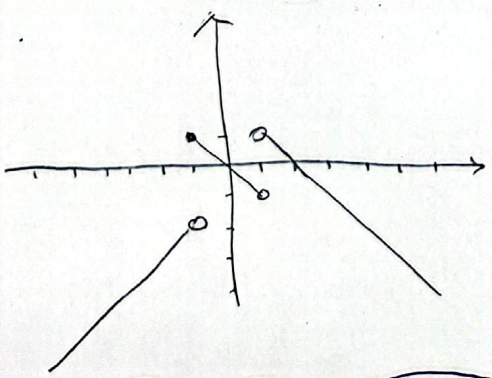
$ax+b \xrightarrow{x=1} a+b$ $\Big\}$ $a+b=0$

$x^3 \xrightarrow{x=2} 8$

$ax+b \xrightarrow{x=2} 2a+b$ $\Big\}$ $2a+b=8$

$\Big\}$ $a=8$, $b=-8$ $\to a\times b = 8\times -8 = -64$

④



$D_f = R-\{1\}$

$R_f = (-\infty, 1]$

⑤ الف) $2y^3+x^2+1=0 \to$ $2y_1^3 = -x^2-1$, $2y_2^3 = -x^2-1$ $\Big\}$ $2y_1^3 = 2y_2^3 \to y_1 = y_2$

← تابع است.

ب) یک نقطه $(\frac{3}{2}, 1)$ $\to (x-1)(2y-3)^2 = 0 \to x^2+4y^2-2x-12y+10=0$

9 1

تابع است

الف) $x\sin y = y\sin x \xrightarrow{x=0} 0 = y\sin 0 \to y=\mathbb{R} \to$ تابع است ⑦

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \to \sqrt{\frac{1}{y}} + \sqrt{y} = 2 \to (1,1)$ تابع → فقط

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⑧

الف) $y = \sqrt{\frac{x-1}{x-3}} + \sqrt{\frac{2-x}{x}}$

$\frac{0 \quad 2}{- \quad + \quad -} \to (0,2]$ ①

$\frac{1 \quad 3}{+ \quad - \quad +} \to (-\infty,1] \cup (3,+\infty)$ ②

$D_f = ① \cap ② = (0,1]$

ب) $\sqrt{x} + \sqrt{y-1} = \sqrt{3} \to \sqrt{y-1} = \sqrt{3} - \sqrt{x} \geq 0 \to \sqrt{3} \geq \sqrt{x}$

$\sqrt{x} \geq 0 \to x \geq 0$ ①

$x \leq 3$ ②

$① \cap ② \to [0,3]$

$D_f =$

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⑨

الف) $y = \frac{\sqrt{x^2-7x+4}}{\sqrt{x-10x+14}}$

$x^2-7x+4 \to x = 1, 4$

$(x-1)(x-4) \geq 0$

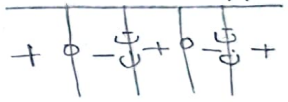
$\frac{1 \quad 4}{+ \quad - \quad +} \to D_f = (-\infty,1] \cup [4,+\infty)$ ①

$\sqrt{x-10x+14} > 0 \to -9x > -14 \to 9x < 14 \to x < \frac{14}{9}$ ②

$\to ① \cap ② \to D_f = (-\infty,1]$

ب) $y = \sqrt{\frac{x^2-7x+4}{x^2-10x+14}} = \sqrt{\frac{(x-1)(x-4)}{(x-2)(x-8)}}$

$\to$



$\to D_f = (-\infty,1] \cup (2,4] \cup (8,+\infty)$

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⑩

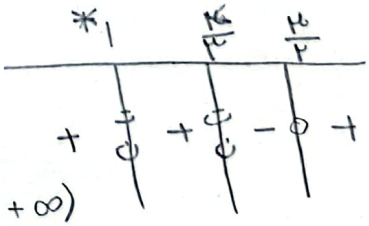
الف) $y = \frac{\sqrt{2x^2-5x+3}}{\sqrt{3x^2-7x+4}}$

$2x^2-5x+3 \to (x-1)(x-\frac{3}{2}) \to x = 1, \frac{3}{2}$

$3x^2-7x+4 \to (x-3)(x-\frac{4}{3}) \to x = 3, \frac{4}{3}$

$\to \frac{1 \quad \frac{3}{2}}{+ \quad - \quad +} \cap \frac{1 \quad \frac{4}{3}}{+ \quad - \quad +} \to D_f = (-\infty,1] \cup [\frac{3}{2},+\infty)$

ب) $\sqrt{\frac{2x^2-5x+3}{3x^2-7x+4}} \to$ نظیر ماتقدمست الف →



$\to D_f = (-\infty,1) \cup (\frac{4}{3},\frac{3}{2}) \cup [\frac{3}{2},+\infty)$