

۱) $A \times B \rightarrow \{(1,2), (1,3), (2,2), (2,3), (3,2), (3,3)\}$
 $B \times B \rightarrow \{(2,2), (2,3), (3,2), (3,3)\}$
 $\ominus \rightarrow \{(1,2), (1,3)\}$ ✓

۲) الف) $m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0 \rightarrow m = -1$
 $(2,1), (2,4)$ ✓

ب) $m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0 \rightarrow m = 2$
 $(-1,4), (-1,3)$ ✓
 به ازای m صحیح مقدار $x(2,1), (2,4)$ ✓

۳) $x=1 \rightarrow (1)^2 - 1 = 0$

$ax+b \rightarrow x=1 \rightarrow a+b=0$

$ax+b \rightarrow x=2 \rightarrow 2a+b=1$

$(a+b) - (a+b) = a \rightarrow 1 \quad a=1$
 $b=-1 \quad (-1) \times 1 = -1$ ✓

۴) $x=2 \rightarrow (2)^2 = 1$

$2x-3 = 2-3x \rightarrow 5x=5 \rightarrow x=1$

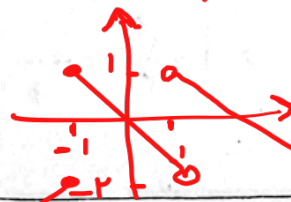
$\begin{cases} 2x-3: x=k \\ 2-3x: x=k \end{cases} \rightarrow k = \frac{5}{5} = 1$ ✓

۵) $x > 1 \rightarrow -x+2 > 1 \rightarrow y < 1$

$-1 < y \leq 1$

$y < -2$

شکل !!!



$R = \{1\}$
 $\Rightarrow (-\infty, 1]$ ✓

۶) $\begin{cases} 2y_1^2 = -x_1^2 - 1 \\ 2y_2^2 = -x_2^2 - 1 \end{cases} \xrightarrow{x_1=x_2} 2y_1^2 = 2y_2^2 \rightarrow y_1^2 = y_2^2 \rightarrow y_1 = y_2$ ✓ ✓

$x^2 - 2x - 1 \quad y^2 - 2y - 1$
 $(x-1)^2 - 2 \quad (y-1)^2 - 2$
 $(x-1)^2 + (y-1)^2 = 0$
 $(x-1)^2 = 0 \rightarrow x=1$
 $(y-1)^2 = 0 \rightarrow y=1$
 نقطه $(1, 1)$

۷) $\sin y = \frac{y \sin x}{x} \Rightarrow \frac{\sin y}{y} = \frac{\sin x}{x}$

$\begin{cases} \frac{\sin y_1}{y_1} = \frac{\sin x}{x} \\ \frac{\sin y_2}{y_2} = \frac{\sin x}{x} \end{cases} \Rightarrow \frac{\sin y_1}{y_1} = \frac{\sin y_2}{y_2}$

برای اثبات از مثال نقض استفاده می‌کنیم نه مثال صحیح
 $\sin -2y_0 = \sin 0 = \sin 2y_0$ ✗

$x=1 \rightarrow y=1$
 $x=-1 \rightarrow y=-1$ ✓

$\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \quad x \neq 0$
 $\sqrt{\frac{x}{y}} = \sqrt{\frac{y}{x}} = 1 \rightarrow x=y$ ✓

1

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

$$\sqrt{\frac{3-x}{x}} \quad \frac{1}{-\frac{1}{x}+\frac{1}{x}-} \quad (0, 3]$$

$$\cap \left\{ D_f = (0, 1] \right\} \checkmark$$

(0, 3)

$$y=1, x=0 \leq y=1, x=3$$

$$D_f = \{3, 0\}$$

$$\sqrt{x} \rightarrow x > 0$$

$$\rightarrow D = [0, 3]$$

$$\sqrt{3-x} \rightarrow 0 \rightarrow x \leq 3$$

(9) (1, 3)

به صورت سوال توجه کنید!

$$\sqrt{\frac{(x-1)(x-4)}{(x-1)(x-4)}} \rightarrow \frac{1}{+\frac{1}{x}-\frac{1}{x}+} \quad \frac{1}{+\frac{1}{x}-\frac{1}{x}+}$$

$$\sqrt{\frac{(x-1)(x-4)}{(x-1)(x-4)}} \rightarrow x-1 < 0 \rightarrow x < 1$$

$$-9x + 14 > 0$$

$$x < \frac{14}{9}$$

$$(-\infty, 1] \cup [4, +\infty) \cap (-\infty, 1) \cup (1, +\infty) \rightarrow D_f = (-\infty, 1] \cup (1, +\infty)$$

$$\sqrt{\frac{(x-1)(x-4)}{(x-1)(x-4)}} \rightarrow \frac{1}{+\frac{1}{x}-\frac{1}{x}+} \quad \frac{1}{+\frac{1}{x}-\frac{1}{x}+}$$

$$\frac{1}{+\frac{1}{x}-\frac{1}{x}+}$$

$$\frac{1}{+\frac{1}{x}-\frac{1}{x}+}$$

$$D_f = (-\infty, 1] \cup (4, 9] \cup (1, +\infty)$$

$$\frac{d \pm \sqrt{d^2 - 24}}{4} \Rightarrow \frac{4}{4}, 1, \frac{1}{4}, \frac{1}{4} \quad \frac{1}{+\frac{1}{x}-\frac{1}{x}+}$$

(10) (5) ✓

$$1, \frac{c}{a} \rightarrow 1, \frac{c}{4} \quad \frac{1}{+\frac{1}{x}-\frac{1}{x}+}$$

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

$$1, \frac{c}{a} \rightarrow 1, \frac{c}{4}$$

$$\frac{1}{+\frac{1}{x}+\frac{1}{x}-\frac{1}{x}+}$$

$$D_f = (-\infty, 1) \cup \left(1, \frac{c}{4}\right) \cup \left[\frac{c}{4}, +\infty\right)$$

$$1, \frac{c}{a} \rightarrow 1, \frac{c}{4}$$