

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره 1 کلاس

الف) $4x^2 - 5x - 4 = 0$ $x^2 - 5x - 16 = 0$ $(x-9)(x+4) = 0$ $\begin{cases} x = -4 \\ x = 9 \end{cases} \xrightarrow{\div 4} -\frac{1}{4}, \frac{9}{4}$ $\leftarrow$ ریشه ها

ب) $3x^2 - 8x - 3 = 0$ $x^2 - 8x - 9 = 0$ $(x+1)(x-9) = 0$ $\begin{cases} x = 9 \\ x = -1 \end{cases} \xrightarrow{\div 3} 3, -\frac{1}{3}$ $\leftarrow$ ریشه ها

ج) $4x^2 - 4x - 3 = 0$ $x^2 - x - 12 = 0$ $(x-4)(x+3) = 0$ $\begin{cases} x = -3 \\ x = 4 \end{cases} \xrightarrow{\div 4} -\frac{3}{4}, \frac{1}{4}$ $\leftarrow$ ریشه ها

د) $2x^2 - 5x - 12 = 0$ $x^2 - 5x - 24 = 0$ $(x-8)(x+3) = 0$ $\begin{cases} x = -3 \\ x = 8 \end{cases} \xrightarrow{\div 2} -\frac{3}{2}, 4$ $\leftarrow$ ریشه ها

الف) $x^2 - 5x - 14 = 0$ $(x-7)(x+2) = 0$ $\begin{cases} x = 7 \\ x = -2 \end{cases} \leftarrow$ ریشه ها

ب) $2x^2 + 5x + 3 = 0$ $\frac{-5 \pm \sqrt{25 - 4 \cdot 2 \cdot 3}}{4} \rightarrow \begin{cases} x = \frac{-5+1}{4} = -1 \\ x = \frac{-5-1}{4} = -\frac{3}{2} \end{cases}$

ج) $x^2 + 4x + 3 = 0$ $\frac{-4 \pm \sqrt{16 - 4 \cdot 1 \cdot 3}}{2} \rightarrow \Delta < 0$ $\leftarrow$ ریشه ها

د) $3x^2 + 3x - 2 = 0$ $\frac{-3 \pm \sqrt{9 - 4 \cdot 3 \cdot (-2)}}{6} \rightarrow \frac{-3 \pm \sqrt{33}}{6} \rightarrow x = \frac{-1}{2} \pm \frac{\sqrt{33}}{6}$

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

الف) $f(n) = \{(1, m^2)(2, m^2)(-3, m)(-2, m)(3, m+2)(m, 4)\}$ $m^2 = m+2 \rightarrow m^2 - m - 2 = 0$ $\begin{cases} m = -1 \\ m = 2 \end{cases}$ $\leftarrow$ ریشه ها

$\rightarrow m = 2$ $a+c=b$ $\leftarrow$ ریشه ها

ب) $g(n) = \{(1, m^2)(2, 1)(m, 4)(3, m+2)(-2, m)(-1, 3)\}$ $m^2 = m+2 \rightarrow m^2 - m - 2 = 0$ $\begin{cases} m = -1 \\ m = 2 \end{cases}$ $\leftarrow$ ریشه ها

$\rightarrow m = 2$ $\leftarrow$ ریشه ها

$f(n) = \{(1, a^2)(1, 2a-2)(a^2, 3a+2)\}$

$2a-2 = a^2 \rightarrow a^2 - 2a + 2 = 0 \rightarrow (a-1)(a-2) = 0$ $\begin{cases} a = 2 \\ a = 1 \end{cases}$ $\leftarrow$ ریشه ها

$\rightarrow a = 2$ $\leftarrow$ ریشه ها

$$f(n) = \begin{cases} n^2 - 1 & n \leq 1 \\ an + b & 1 \leq n \leq 2 \\ n^2 & n \geq 2 \end{cases}$$

$$n=2 \rightarrow n^2 = an + b \rightarrow 1 = 2a + b$$

$$n=1 \rightarrow n^2 - 1 = an + b \rightarrow 1 - 1 = a + b \rightarrow a + b = 0$$

$$\begin{cases} 2a + b = 1 \\ a + b = 0 \end{cases} \rightarrow \begin{cases} a = 1 \\ b = -1 \end{cases}$$

$$a \times b \rightarrow 1 \times (-1) = -1$$

$$f(n) = \begin{cases} 2n - 3 & n \geq K \\ f - 3K & n \leq K \end{cases}$$

$$2n - 3 = f - 3K \rightarrow 2K - 3 = f - 3K \rightarrow -\Delta K = -V \rightarrow \Delta K = V \rightarrow K = \frac{V}{\Delta}$$

$$\text{الف) } y^3 - 4y = x^2 - 4x + 3 \quad x^2 - 4x + 3 = (x-2)^2 - 1 \rightarrow y^3 - 4y = (x-2)^2 - 1$$

$$\text{ب) } |x| + |y| = 3 \quad \text{نقش} \rightarrow x=1 \rightarrow 1 + |y| = 3 \rightarrow |y| = 2 \rightarrow y = -2$$

$$\text{ج) } |y| = \sqrt{1 - \cos x} \quad \text{نقش} \rightarrow x=90 \rightarrow \sqrt{1-0} = 1 \rightarrow |y| = 1 \rightarrow y = 1$$

$$\text{د) } y^2 + x^2 + 2x + 1 = 0 \quad y^2 + (x+1)^2 = 0 \rightarrow y = 1 \quad \checkmark$$

$$\text{الف) } \sqrt[3]{y} + x^2 = 2x - 2 \quad \begin{cases} \sqrt[3]{y_1} = 2x - 2 - x^2 \\ \sqrt[3]{y_2} = 2x - 2 - x^2 \end{cases} \rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2$$

$$\text{ب) } y^3 + xy = \Delta x \quad \begin{cases} y_1^3 + xy_1 = \Delta x \\ y_2^3 + xy_2 = \Delta x \end{cases} \rightarrow y_1^3 + xy_1 = y_2^3 + xy_2 \rightarrow y_1^3 - y_2^3 + xy_1 - xy_2 = 0$$

$$\rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) + x(y_1 - y_2) = 0 \rightarrow (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + x) = 0$$

$$\text{الف) } x \sin y = y \sin x$$

$$x=0 \rightarrow 0 \times \sin y = y \sin 0 \rightarrow 0=0$$

$$\text{نقش} \quad \text{برای } x=0 \text{ هر } y \text{ در جواب منطبق است}$$

$$\text{ب) } \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

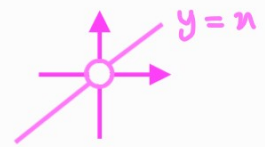
$$\frac{x}{y} + \frac{y}{x} + 2\left(\frac{x}{y} \times \frac{y}{x}\right) = 4 \rightarrow \frac{x^2 + y^2 - 2xy}{xy} = 0 \rightarrow \frac{(x-y)^2}{xy} = 0$$

$$\rightarrow (x-y)^2 = 0 \rightarrow x=y$$

$$(10-ب) \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

این عبارت تنها زمانی به‌قرار است که $1 = \sqrt{\frac{x}{y}}$ باشد پس

$$\sqrt{\frac{x}{y}} = 1 \leadsto \frac{x}{y} = 1 \leadsto x = y \text{ و } (x, y \neq 0)$$



$$(4-ب) (3, m^2) \text{ و } (3, m+2) \leadsto m^2 = m+2 \leadsto m^2 - m - 2 = 0$$

$$m = 2 \rightarrow (2, 1) \text{ و } (2, 4) \quad \times$$

$$m = -1 \rightarrow (-1, 4) \text{ و } (-1, 3) \quad \times$$

به‌ازای هیچ مقدار m عبارت تأیید نیست!