

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره کلاس پایه دبیر B.....

ا) $x^2 - 5x - 6 = 0 \Rightarrow x^2 - 5x - 36$
 $\Delta = b^2 - 4ac = 25 + 144 = 169 \Rightarrow \sqrt{\Delta} = \sqrt{169} = 13$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm 13}{2} \Rightarrow \begin{cases} x = 9 \\ x = -4 \end{cases}$

ب) $x^2 - 11x - 9 = 0 \Rightarrow x^2 - 11x - 9$
 $\Delta = b^2 - 4ac = 121 + 36 = 157 \Rightarrow \sqrt{\Delta} = \sqrt{157}$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{11 \pm \sqrt{157}}{2} \Rightarrow \begin{cases} x = \frac{11 + \sqrt{157}}{2} \\ x = \frac{11 - \sqrt{157}}{2} \end{cases}$

ج) $x^2 - 4x - 12 = 0 \Rightarrow x^2 - 4x - 12$
 $\Delta = b^2 - 4ac = 16 + 48 = 64 \Rightarrow \sqrt{\Delta} = \sqrt{64} = 8$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{4 \pm 8}{2} \Rightarrow \begin{cases} x = 6 \\ x = -2 \end{cases}$

د) $x^2 - 5x - 12 = 0 \Rightarrow x^2 - 5x - 12$
 $\Delta = b^2 - 4ac = 25 + 48 = 73 \Rightarrow \sqrt{\Delta} = \sqrt{73}$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{5 \pm \sqrt{73}}{2} \Rightarrow \begin{cases} x = \frac{5 + \sqrt{73}}{2} \\ x = \frac{5 - \sqrt{73}}{2} \end{cases}$

ا) $x^2 - 2x - 14 = 0$
 $\Delta = b^2 - 4ac = 4 + 56 = 60 \Rightarrow \sqrt{\Delta} = \sqrt{60} = 2\sqrt{15}$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm 2\sqrt{15}}{2} \Rightarrow \begin{cases} x = 1 + \sqrt{15} \\ x = 1 - \sqrt{15} \end{cases}$

ب) $x^2 + 2x + 1 = 0$
 $\Delta = b^2 - 4ac = 4 - 4 = 0 \Rightarrow \sqrt{\Delta} = 0$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-2 \pm 0}{2} = -1$

ج) $x^2 + 2x + 2 = 0$
 $\Delta = b^2 - 4ac = 4 - 8 = -4 < 0$
 هیچ ریشه حقیقی ندارد.

د) $3x^2 + 3x - 2 = 0$
 $\Delta = b^2 - 4ac = 9 + 24 = 33 \Rightarrow \sqrt{\Delta} = \sqrt{33}$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{-3 \pm \sqrt{33}}{6} \Rightarrow \begin{cases} x = \frac{-3 + \sqrt{33}}{6} \\ x = \frac{-3 - \sqrt{33}}{6} \end{cases}$

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

ا) $f(x) = \{(2, m^2)(2, 1)(-1, m)(-1, m+2)(m, 4)\}$
 $m+2 = m^2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m = -1, 2 \rightarrow (2, 4)(2, 1)$

ب) $g(x) = \{(2, m^2)(2, 1)(m, 4)(3, m+2)(-1, m)(-1, 2)\}$
 $m^2 = m+2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m = -1, 2$
 $(-1, 2)(-1, 4) \quad (2, 1)(2, 4)$
 m تعریف نمی شود و است.

$f(x) = \{(1, a^2)(1, 2a-2)(a^2, 2a+2)\}$
 $a^2 = 2a-2 \Rightarrow a^2 - 2a + 2 = 0 \Rightarrow a = 1, 1 \rightarrow (1, 1)(1, 2)$

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

$$\begin{aligned} x=1 &\Rightarrow 1-1=a+b \Rightarrow a+b=0 \\ x=2 &\Rightarrow 2a+b=1 \end{aligned} \Rightarrow \begin{cases} a+b=0 \\ 2a+b=1 \end{cases} \Rightarrow a=1 \Rightarrow b=-1 \Rightarrow a \times b = 1 \times (-1) = \boxed{-1}$$

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$$f(x) = \begin{cases} 2x-2 & x \geq k \\ 4-2x & x \leq k \end{cases}$$

$$x=k \Rightarrow 2k-2=4-2k \Rightarrow 4k=6 \Rightarrow k=\frac{3}{2} = 1.5$$

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الف) $y^2 - 6y = x^2 - 4x + 3$
 $y^2 - y \rightarrow$ تابع نیست

ب) $|x| + |y| = 3 \xrightarrow{x=2} 2 + |y| = 3 \Rightarrow |y| = 1 \Rightarrow y = 1, -1 \rightarrow$ تابع نیست

ج) $|y| = \sqrt{1 - \cos x} \xrightarrow{x=0} |y| = 1 \Rightarrow y = 1, -1 \rightarrow$ تابع نیست

د) $y^2 + x^2 + 2x + 1 = 0$

$\Delta = b^2 - 4ac = 4 - 4 = 0 \rightarrow$ همیشه منفی $\oplus$
 همیشه منفی $\oplus$

$\oplus \text{ و } \oplus \Rightarrow \begin{cases} y^2 = 0 \Rightarrow y = 0 \\ x^2 + 2x + 1 = 0 \Rightarrow x = -1 \end{cases} \rightarrow$ تابع هست

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الف) $\sqrt{y} + x^2 = 2x - 2 \Rightarrow \sqrt{y} = -x^2 + 2x - 2$

$\rightarrow \begin{cases} \sqrt{y_1} = -x^2 + 2x - 2 \\ \sqrt{y_2} = -x^2 + 2x - 2 \end{cases} \Rightarrow \sqrt{y_1} = \sqrt{y_2} \Rightarrow y_1 = y_2 \rightarrow$ تابع هست

ب) $y^2 + 2y = \omega x \rightarrow \begin{cases} y_1^2 + 2y_1 = \omega x \\ y_2^2 + 2y_2 = \omega x \end{cases} \Rightarrow y_1^2 + 2y_1 = y_2^2 + 2y_2 \Rightarrow y_1^2 - y_2^2 + 2y_1 - 2y_2 = 0 \Rightarrow (y_1 - y_2)(y_1 + y_2 + 2) = 0$
 $+ 2(y_1 - y_2) = 0 \Rightarrow (y_1 - y_2)(y_1 + y_2 + 2) = 0 \Rightarrow \begin{cases} y_1 = y_2 \Rightarrow y_1 = y_2 \\ y_1^2 + y_1 y_2 + y_2^2 + 2 = 0 \end{cases}$
 $\oplus y_1 = \frac{-y_2 \pm \sqrt{y_2^2 - 4}}{2}$
 $\Delta = b^2 - 4ac = y_2^2 - 4(y_2^2 + 2) = y_2^2 - 4y_2^2 - 8 = -3y_2^2 - 8$
 $\rightarrow y_1 = \frac{-y_2 \pm \sqrt{-3y_2^2 - 8}}{2}$
 Δ همیشه منفی است، پس رابطه مرکز برقرار نیست، پس $y_1 = y_2$ است و عبارت تابع است.

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الف) $x \sin y = y \sin x \xrightarrow{x=\pi} \pi \sin y = 0 \Rightarrow \sin y = 0 \Rightarrow y = \pi, 0 \rightarrow$ تابع نیست

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{yx}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} + 2 = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} = 0 \Rightarrow \frac{x}{y} = -\frac{y}{x} \Rightarrow x^2 = -y^2$

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لکه مرکز برقرار نیست، پس عبارت تابع نیست.