نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۲۴ کلاس دهم (پروژه)

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$y = 2x^2 - 4x + 1 \rightarrow a > 0 \rightarrow$ دارد Min

$ext \begin{cases} -\frac{b}{2a} \rightarrow \frac{4}{4} = +1 \\ -\frac{\Delta}{4a} \rightarrow \text{جایگذاری} \rightarrow 2 - 4 + 1 = -1 \end{cases} \rightarrow \begin{bmatrix} 1 \\ -1 \end{bmatrix} \rightarrow$ محور تقارن $x = +1$

$y = -2x^2 + 3x - 5$

$ext \begin{cases} -\frac{b}{2a} \rightarrow \frac{-3}{-4} = \frac{3}{4} \\ -\frac{\Delta}{4a} \rightarrow \text{جایگذاری} \rightarrow -5 + \frac{3}{4} \times 3 + 2 \times \frac{9}{16} \rightarrow -\frac{31}{8} \end{cases} \rightarrow \begin{bmatrix} \frac{3}{4} \\ -\frac{31}{8} \end{bmatrix} \rightarrow$ محور تقارن $x = \frac{3}{4}$

$a < 0 \rightarrow$ دارد Max

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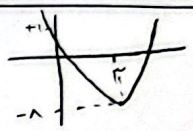
الف) $y = x^2 - 4x + 1 \rightarrow a > 0 \rightarrow$ دارد Min

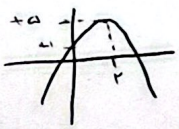
$ext \begin{cases} -\frac{b}{2a} \rightarrow \frac{4}{2} = 2 \\ -\frac{\Delta}{4a} \rightarrow \text{جایگذاری} \rightarrow 4 - 8 + 1 = -3 \end{cases} \rightarrow$ محور تقارن $x = 2$



ب) $y = -x^2 + 6x + 1 \rightarrow$ عرض از مبدا

$a < 0$ (دارد Max)

$ext \begin{cases} -\frac{b}{2a} \rightarrow \frac{-6}{-2} = 3 \\ -\frac{\Delta}{4a} \rightarrow \text{جایگذاری} \rightarrow -9 + 18 + 1 = 10 \end{cases} \rightarrow$ محور تقارن $x = 3$



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$4x^3 + kx^2 - 9x - 2 = 0$ ریشه‌ها: α, β

$\alpha + \beta = 1$, $\alpha\beta = -2$, $k = ?$

$\rightarrow x^2 - sx + p = 0 \rightarrow x^2 - 1 - 2 = 0 \rightarrow (x^2 - 1 - 2)(\bigcirc) = 4x^3 + kx^2 - 9x - 2$

$\bigcirc \rightarrow 4x + a$

$\rightarrow 4x^3 - 4x^2 - 8x + ax^2 - ax - 2a \xrightarrow{\text{مرتب}} 4x^3 + (a-4)x^2 + (a-8)x - 2a$

$(-2) = 4x^3 + kx^2 - 9x$

$a = 1$

جا بزن $\rightarrow (-3) \rightarrow -2a = -4 + a \rightarrow k = -4 + a$

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$x^2 - 3mx + m = 0 \rightarrow \alpha, \beta \rightarrow \sqrt{\alpha} - \sqrt{\beta} = 1 \xrightarrow{\text{به توان ۲}} \frac{a+\beta}{S} - 2\sqrt{\frac{\alpha\beta}{P}} = 1 \rightarrow 3m - 2\sqrt{m} = 1$

$\sqrt{m} = t$

$2x^2 - mx - m = 0 \rightarrow \frac{c}{a} = ?$

$S = -\frac{b}{a} \rightarrow (3m)$

$P \rightarrow \frac{c}{a} \rightarrow (m)$

$\begin{cases} 3t^2 - 2t - 1 = 0 \\ \Delta = b^2 - 4ac \rightarrow 4 - 4(3)(-1) = (16) \\ t = \frac{2 \pm 4}{6} \end{cases}$

$t = 1 \rightarrow \sqrt{m} = 1 \rightarrow m = +1$

$t = -\frac{1}{3}$ (غ ق ق) $\neq$ (+)

$\frac{c}{a} \rightarrow m = +1 \rightarrow -\frac{m}{2} \rightarrow -\frac{1}{2}$

جا بزن بره

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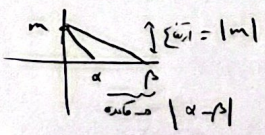
$y = 2x^2 - (m+2)x + m$ / $y = x^2 - mx + 1 \rightarrow -\frac{b}{2a} = \frac{m}{2} = ?$

برخورد با عرض‌ها $\rightarrow x = 0 \rightarrow y = m$

برخورد با محور xها = ریشه‌ها = α, β $\rightarrow y = 0 \rightarrow \begin{bmatrix} \alpha \\ \beta \end{bmatrix}$



$|m| \times \frac{|\alpha - \beta|}{2} = \frac{3}{2}$

$|\alpha - \beta| \rightarrow \frac{\sqrt{\Delta}}{|a|} \rightarrow \frac{\sqrt{m^2 - 4}}{2} \rightarrow \frac{|m-2|}{2}$

$|m| \times \frac{|m-2|}{2} = \frac{3}{2} \rightarrow \frac{|m||m-2|}{+} = \frac{3}{+} \rightarrow m(m-2) = 3$

$m^2 - 2m = 3$

$m^2 - 2m - 3 = 0$

$(m+1)(m-3) = 0$

$m = -1$, $m = 3$

$\frac{m}{2} \rightarrow \begin{bmatrix} -\frac{1}{2} \\ \frac{3}{2} \end{bmatrix}$

جا بزن حذا

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$y = ax^2 + 3x + a$

ax^2 { $\frac{-b}{2a} \to \frac{-3}{2a}$; $\frac{y}{x}$ مضاعف $\to \frac{-(b^2-4ac)}{4a} = \frac{-b^2+4ac}{4a} \to \frac{-9+4a^2}{4a} = \frac{7}{8} \Rightarrow 28a = -72 + 32a^2 - 32a^2 - 28a - 72 = 0$ ÷4

$8a^2 - 7a - 18 = 0$ روش ← $a^2 - 7a - 144 = 0$

$(a+9)(a-16) = 0$ ← $a = \frac{-9}{8}$ یا $a = \frac{16}{8}$

کمترین مقدار ← $a > 0$ ← min دارد ← $a = 2$ جواب نهایی

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$x^2 - (a+1)x + a = 0$ ← $\Delta = (a+1)^2 - 4a = a^2 + 2a + 1 - 4a = a^2 - 2a + 1$ ← $\sqrt{\Delta} = a - 1$ ← $x = \frac{a+1 \pm (a-1)}{2}$

$x_1 = a$ ، $x_2 = 1$ ← $x_1 \in \mathbb{N}$ ← $a = 2k-1$ ، $2k+1$ ($k \in \mathbb{N}$)

$a = 2k-1$ ← $P = \frac{a}{b}$ ← $a = (2k+1)(2k-1) = 4k^2 - 1$

$\frac{4k^2-1}{4k(k-1)} = 0$ ← $\begin{cases} 2k+1 \to (+) \\ 2k-1 \to (-) \end{cases}$ ریشه‌ها

$k = 1$ ← $a = 3$ ← $a = 4k-1$; $k = 0$ ← $a = -1$ (غیر قابل قبول)

$x^2 - (2a+1)x + b = 0$ ← $x_1 = 2$ ، $x_2 = z$ ← $S = 3a = 1 + z$ ← $P = b = z(z+1) = 6$

$a = 3$ ← $z = 3a - 1 = 8$ ← $z = 4$ ← $b = 4 \times 6 = 24$

اختلاف جواب‌ها ← $24 - 3 = 21$ ← جواب

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$y = -ax^2 + ax + 2$ ← $-\frac{b}{2a} = \frac{-a}{-2a} = \frac{1}{2}$

$y = 2bx^2 - bx - 1$ ← $-\frac{b}{2a} = \frac{b}{4} = \frac{1}{3}$

$\frac{1}{4}$ اول ← $-a \times \frac{1}{16} + \frac{a}{4} + 2 = \frac{3a+32}{16}$

$\frac{1}{4}$ دوم ← $-1 - b \times \frac{1}{16} + 2b \times \frac{1}{16} = \frac{-b-7}{7}$

$\frac{3a+32}{16} = \frac{-b-7}{7} \to \frac{3(-12)+32}{16} = \frac{-b-7}{7} \to -3b - 43 = -7$

$b = -4$

$\frac{1}{2}$ اول ← $-a \times \frac{1}{4} + \frac{1}{2}a + 2 = \frac{a+8}{4}$

$\frac{1}{2}$ دوم ← $-1 - \frac{1}{2}b + 2b \times \frac{1}{4} = -1$

$\frac{a+8}{4} = -1 \to a + 8 = -4$

$a = -12$

$b - a = -4 - (-12) = 8$ ← جواب نهایی

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$a = \frac{\pi}{2\alpha} \to y = -8x^2 + 4x + 1$

ex^2 { $\frac{-4}{10} = \frac{-2}{5}$; $\frac{14+20}{-4(-5)} = \frac{34}{20}$ ← بزرگ‌تر ← جواب

$x = \pm\frac{1}{2}$

$\alpha + \beta = \frac{-4}{2a}$ ← $\alpha = \frac{1}{2} \to \beta = -\frac{4}{2} - \frac{1}{2} = -1$ ← $\alpha < \beta$ چون

$\alpha = -\frac{1}{2} \to \beta = \frac{4}{2} + \frac{1}{2} = 1$ ✓

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$ab = a + b - 1$ ← $P = S - 1$

$a + b = a^2 + b^2 - 12$ ← $S = S^2 - 2P - 12$

$S = S^2 - 2(S-1) - 12$ ← $S = S^2 - 2S - 10$

$S^2 - 3S - 10 = 0$ ← $(S-5)(S+2) = 0$

$S = 5$ ← ✓ (قبول)

$S = -2a \longrightarrow a + b > 1$

a, b جواب