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فاطمه احمدی   تکلیف شماره ۲۴   کلاس دهم دختر A

۱- ۲

الف) $y = 2x^2 - 4x + 1 \rightsquigarrow a > 0 \quad \underset{}{\overset{min}{U}}$ ext $\left|\begin{array}{l} x = \frac{-b}{2a} = \frac{4}{4} = 1 \\ y(\text{جایگذاری}) = -1 \end{array}\right.$

$2(1)^2 - 4(1) + 1 = -1$

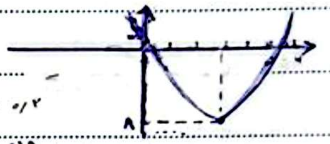
ب) $y = -2x^2 + 3x - 5 \rightsquigarrow a < 0 \quad \cap (max)$ ext $\left|\begin{array}{l} x = \frac{-b}{2a} = \frac{-3}{-4} = \frac{3}{4} \\ y(\text{جایگذاری}) = \frac{-31}{8} \end{array}\right.$

$\frac{-31}{8} = \frac{-9}{8} + \frac{18}{8} - \frac{40}{8} \quad -2\left(\frac{9}{16}\right) + 3\left(\frac{3}{4}\right) - 5$

۲- ۲

الف) $y = x^2 - 6x + 1 \rightsquigarrow a > 0 / min\ U /$ ext $\left| \frac{-b}{2a} = \frac{6}{2} = 3 \right.$, -8

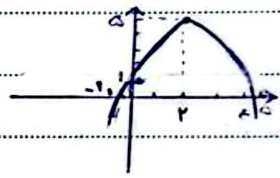
$\Delta = b^2 - 4ac = 36 - 4(1) = 32 \rightarrow x = \frac{6 \pm 4\sqrt{2}}{2}$, $\frac{2(3 \pm 2\sqrt{2})}{2}$, $3 - 2\sqrt{2} \simeq 0.2$, $3 + 2\sqrt{2} \simeq 5.8$



ب) $y = -x^2 + 4x + 1 \rightsquigarrow a < 0 / max \cap /$ ext $\left| \frac{-b}{2a} = \frac{-4}{-2} = 2 \right.$, 5

$\Delta = 16 - 4(-1) = 20 \rightarrow x = \frac{-4 \pm 2\sqrt{5}}{-2}$, $\frac{2(-2 \pm \sqrt{5})}{-2}$

x: $2 + \sqrt{5} \simeq 4.2$, $2 - \sqrt{5} \simeq -0.2$



۳- ۲

$4x^3 + kx^2 - 9x - 2 = 0 \ / \ \alpha\beta = -2 \ / \ \alpha + \beta = 1 \ / \ k = ?$

$x^2 - (\alpha + \beta)x + \beta\alpha = 0 \rightsquigarrow x^2 - x - 2 = 0 \rightsquigarrow (x-2)(x+1) = 0 \rightarrow \alpha = 2, \beta = -1$

$\alpha = 2 \rightsquigarrow 4(2)^3 + k(2)^2 - 9(2) - 2 = 0 \rightarrow 32 + 4k - 18 - 2 = 0 \rightarrow 4k = -12 \Rightarrow k = -3$

۴- ۲

$x^2 - 3mx + m = 0 \ (\alpha, \beta) \rightsquigarrow \alpha + \beta = 3m / \alpha\beta = m \ / \ |\sqrt{\alpha} - \sqrt{\beta}| = 1 \rightsquigarrow (\sqrt{\alpha} - \sqrt{\beta})^2 = 1$

$\alpha + \beta - 2\sqrt{\alpha\beta} = 1 \rightsquigarrow 3m - 2\sqrt{m} = 1$

$3m - 2\sqrt{m} - 1 = 0 \rightarrow$ (تغییر $t \rightarrow \sqrt{m} = t$) $\rightsquigarrow 3t^2 - 2t - 1 = 0 \rightsquigarrow \Delta = 4 - 4(-1)(3) = 16 \rightarrow x = \frac{2 \pm 4}{6} \Rightarrow 1 , \frac{-1}{3}$ ✗

$2x^2 - mx - m = 0 \overset{m=1}{\rightsquigarrow} 2x^2 - x - 1 = 0$ $m = 1$

ب) $\Delta = 1 - 4(-1)(2) = 9 \rightarrow x = \frac{1 \pm 3}{4}$, $-\frac{1}{2}$, 1

۵- ۲

$y = 2x^2 - (m+2)x + m \rightsquigarrow a + b + c = 0 \rightsquigarrow x = 1 / \frac{m}{2}$ $\langle y(0) = m \rangle$

مساحت $= \frac{3}{4}$ $S = \frac{1}{2}\left|m\left(\frac{m}{2} - 1\right)\right| \rightarrow \left|m\left(\frac{m}{2} - 1\right)\right| = \frac{3}{2} \rightarrow |m(m-2)| = 3$

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

$m = -1 \rightarrow \frac{m}{2} = -\frac{1}{2}$ ب

$m = 3 \rightsquigarrow \frac{m}{2} = \frac{3}{2} \rightsquigarrow$ غ ق ق

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$y = ax^2 + 3x + a \rightsquigarrow \frac{7}{8} \rightsquigarrow$ مینیمم $\min = a > 0$ — ۶- ②

ext $\frac{-b}{2a} = \frac{-3}{2a}$

$\frac{-\Delta}{4a} = \frac{-9+4a^2}{4a} = a - \frac{9}{4a} = \frac{7}{8} \rightsquigarrow 8a^2 - 7a - 18 = 0 \rightsquigarrow \Delta = 49 - 4(8)(-18) = 625 \rightsquigarrow a = \frac{7 \pm 25}{16} = 2 \;(a>0,\ ②) \;/\; -\frac{9}{8}$

پس تنها $a=2$

$x^2 - (a+1)x + a = 0 \rightsquigarrow a+b+c=0 \;\Big\langle\; 1 \;/\; 2n+1 + 3$ (فرد) $= a$ — ۷- ①

$x^2 - (3a+1)x + b = 0$

$\hookrightarrow a = 3 \Rightarrow x^2 - 10x + b = 0 \;\Big\langle\; 2k \;/\; 2k+2 \quad x_1 + x_2 = 4k+2 \rightsquigarrow 4k+2 = \underbrace{3a+1}_{10} \rightsquigarrow \underline{k=2}$

$\rightsquigarrow x_1 = 4 \;/\; x_2 = 6$

$(4\times 6) - (1\times 3) = \underline{21}$

$y = -ax^2 + ax + 2 \;/\; y = 2bx^2 - bx - 1 \;/\; b - a = ?$ — ۸- ②

ext $\frac{-b}{2a} = \frac{-a}{-2a} = \frac{1}{2}$

$y(\text{رأس}) = -a(\frac{1}{4}) + a(\frac{1}{2}) + 2 = \frac{a}{4} + 2$

$x = \frac{1}{2} \Rightarrow \frac{a}{4} + 2 = 2b(\frac{1}{2})^2 - b(\frac{1}{2}) - 1 \rightarrow \frac{a}{4} + 2 = -1$

$y = \frac{a}{4} + 2$

$\frac{a}{4} = -3 \Rightarrow \underline{a = -12}$

$a+b = -12 \;/\; b = -12 - a \rightsquigarrow b - a = -12 - a - a = -12 - \underset{-12\cdot 2}{\overset{-24}{2a}} = \underline{12}$

$y = \overset{\mapsto -5x^2+4x+1}{25\alpha x^2 + 4x + \beta}, \quad \beta > \alpha \qquad \beta + \alpha = \frac{-b}{a} = \frac{-4}{25\alpha} \qquad \alpha\beta = \frac{\beta}{25\alpha} \rightsquigarrow \alpha^2 = \frac{1}{25} \rightarrow \alpha = \pm\frac{1}{5}$ — ۹- ②

$x = \alpha: \; 25\alpha \times \frac{1}{25} + 4\alpha + \beta = 0 \rightarrow 5\alpha + \beta = 0 \rightarrow \beta = -5\alpha \xrightarrow{(\beta>\alpha)} \underline{\alpha = \frac{-1}{5}, \; \beta = 1}$

ext $\left| \begin{array}{l} \frac{-b}{2a} = \frac{-4}{2(25\alpha)} = \frac{-2}{25\alpha} = \frac{2}{5} \\ y(\text{رأس}) = \frac{9}{5} \end{array} \right.$ $\rightsquigarrow$ این کارها اضافه است.

$x^2 - (a^2 + b^2 - 12)x + (a+b-1) = 0$ — ۱۰- ②

① $a^2 + b^2 - 12 = a + b \;/\;$ ② $a + b - 1 = ab$

$a^2 + b^2 = (a+b)^2 - 2ab \rightarrow \underbrace{(a+b)}_{t}^2 - 2\underbrace{(a+b-1)}_{t} - 12 = \underbrace{a+b}_{t} \rightarrow t^2 - 3t - 10 = 0 \rightarrow (t-5)(t+2) = 0$

$t = a+b = 5 \;/\; -2$