تاریخ:

ضعیف

نام و نام خانوادگی؟

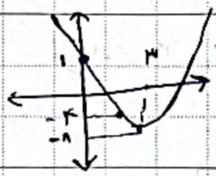
۱)

الف) $y = 2x^2 - 4x + 1 \to a>0 \quad \text{Min} \left| \begin{array}{l} \frac{-b}{2a} = 1 \\ \frac{-\Delta}{4a} = -1 \end{array} \right. \quad \left| \begin{array}{l} 1 \\ -1 \end{array} \right.$ ۲

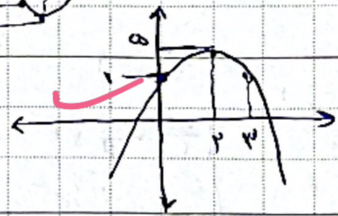
ب) $y = -2x^2 + 4x - 5 \Rightarrow \left| \begin{array}{l} 3/4 \\ -31/8 \end{array} \right.$

۲)

الف) $y = x^2 - 4x + 1 \quad \left| \begin{array}{l} 3 \\ -8 \end{array} \right. \quad \left| \begin{array}{l} 1 \\ -4 \end{array} \right. \quad \left| \begin{array}{l} 0 \\ 1 \end{array} \right.$



ب) $y = -x^2 + 4x + 1 \quad \left| \begin{array}{l} 0 \\ 1 \end{array} \right. \quad \left| \begin{array}{l} 3 \\ 4 \end{array} \right.$ ۲



۳) $4x^3 + kx^2 - 9x - 2 = 0 \qquad \beta^2 - \beta - 2 = 0 \quad (\beta - 2)(\beta + 1) = 0 \begin{cases} \beta = -1, \alpha = 2 \\ \beta = 2, \alpha = -1 \end{cases}$

$\left.\begin{array}{l} \alpha\beta = -2 \\ \alpha + \beta = 1 \end{array}\right\} \alpha = 1 - \beta \quad (1-\beta)\beta = -2$

$x_1, x_2 \to -1, 2 \qquad 4\times 8 + 4k - 18 - 2 = 0 \to 12 + 4k = 0 \quad k = -3$

$-4 + k + 9 - 2 = 0 \quad k + 3 = 0 \quad k = -3$ ۲

۴)

$x^2 - 3mx + m = 0$

$|\sqrt{\alpha} - \sqrt{\beta}| = 1 \longrightarrow \underbrace{\alpha + \beta}_{3m} + \underbrace{(-2\sqrt{\alpha\beta})}_{-2\sqrt{m}} = 1$

$3m - 2\sqrt{m} - 1 = 0 \qquad (3\sqrt{m} + 1)(\sqrt{m} - 1) = 0 \begin{cases} \sqrt{m} = 1 ✓ \Rightarrow m = 1 \\ 3\sqrt{m} = -1 \times \end{cases}$

$m = 1 \quad 2x^2 - x - 1 = 0 \longrightarrow \alpha\beta = \boxed{-1/2}$ ۲

۵) $S = \frac{m\left(\frac{\sqrt{\Delta}}{|a|}\right)}{2} = 3/4 \qquad \frac{m\left(\sqrt{(m+2)^2 - 8m}\right)}{2} = 3/4$

$m\left(\sqrt{(m-2)^2}\right) = 3 \Rightarrow m(|m-2|) = 3 \begin{cases} m < 2 \to m^2 - 2m + 3 = 0 \to m = 3 \\ m > 2 \to m^2 - 2m - 3 = 0 \end{cases}$ ۱/۷۵

$3 = m \longrightarrow y = x^2 - mx + 1 = x^2 - 3x + 1 \quad \frac{-b}{2a} = \boxed{3/2}$

۶) $y = ax^2 + 3x + a \qquad y_{min} = 7/8 \Rightarrow a > 0$

$\frac{-\Delta}{4a} = 7/8 = y \longrightarrow \frac{-(9 - 4a^2)}{4a} = 7/8 \qquad -2(9 - 4a^2) = 7a \qquad 8a^2 - 7a - 18 = 0$

$\Delta = 49 + 4\times 18\times 8 = 625 \qquad a_1, a_2 = \frac{7 \pm \sqrt{625}}{16} \to \begin{cases} 32/16 = 2 \to \boxed{a = 2} \\ \frac{-18}{16} \to < 0 \times \end{cases}$

۲

تاریخ:

ABP VIBRO
Vibration Measurement Systems Manufacturer

(7) $x^2-(a+1)x+a=0 \quad \frac{\sqrt{\Delta}}{|a|}=2 \quad \sqrt{(a+1)^2-4a}=2 \quad (a-1)^2=4$

$(a-3)(a+1)=0 \rightarrow a=-1,\ a=3 \Rightarrow \text{if } a=-1 \Rightarrow x_2=\pm 1 \notin N$

$x^2-(3a+1)x+b=0 \quad \sqrt{100-4b}=2 \quad 100-4b=4 \quad 4b=96 \quad b=24$

$a=3$

$P_2=b=24 \quad |P_2-P_1| = 24-3=\boxed{21}$

2

(8)

(1) $y=-ax^2+ax+2 \quad \Big| \ \frac{-a}{-2a}=\frac{1}{2} \quad \frac{-a}{4}+\frac{a}{2}+2=\frac{a+8}{4}$

(3) $\frac{3b}{4}-\frac{b}{2}-1=\frac{a+8}{4} \rightarrow \frac{a+8}{4}=-1 \Rightarrow \boxed{a=-12}$

(2) $y=2bx^2-bx-1 \quad \Big| \ \frac{b}{4b} \quad \frac{2b}{16} \quad \Big| \ \frac{1}{4} \quad \frac{-(b+8)}{8}$

(4) $\frac{-a}{16}+\frac{a}{4}+2=\frac{-(b+8)}{8}=\frac{-a+4a+32}{16}$

$\frac{3a+32}{16} \Rightarrow 2=(b+8) \Rightarrow b-a=6$

2

(9) ? 0

(10) $a+b=S \quad ab=P$

$S=(a^2+b^2-12)=S^2-2P-12$

$a+b-1=S-1 \quad P=S-1 \quad S^2-2(S-1)-12=S$

$S^2-2S-10=S$

$S^2-3S-10=0 \quad (S-5)(S+2)=0 \quad S=5 \rightarrow a+b=5 \ \text{یا} \ -2$

$S=-2$

2

$ab\in N \rightarrow ab=P>0 \quad S=5 \quad P=4 \quad a+b=5$

$S=-2 \quad P=-3$ ✗

۹

$$\frac{c}{a} = \frac{\cancel{\beta}}{25\alpha} = \alpha\cancel{\beta} \rightarrow \alpha^2 = \frac{1}{25} \rightarrow \alpha = \pm\frac{1}{5}$$

$$-\frac{b}{a} = \frac{-4}{25\alpha} = \alpha+\beta \begin{cases} \alpha = \frac{1}{5} \rightarrow \beta = -1 \\ \alpha = -\frac{1}{5} \rightarrow \beta = 1 \checkmark (\beta > \alpha) \end{cases}$$

$$y = -5x^2 + 4x + 1 \rightarrow \begin{cases} x_S = \frac{4}{10} \text{ مثبت} \\ y_S = \frac{-\Delta}{4a} = \frac{-(16+20)}{-20} = \frac{9}{5} \text{ مثبت} \end{cases}$$

$\boxed{\text{* راس سهمی در ناحیه اول است}}$

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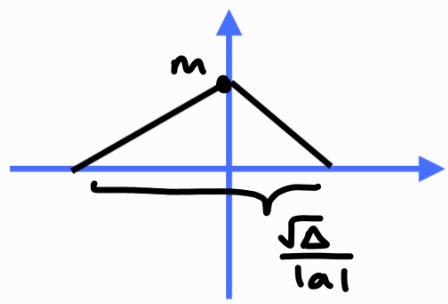
$$S = \frac{1}{\cancel{2}} \times m \times \frac{\sqrt{m^2+4-4m}}{\cancel{2}} = \left|\frac{3}{\cancel{4}}\right|$$



$$m|m-2| = |3| \rightarrow \begin{cases} m|m-2| = 3 & 1 \\ m|m-2| = -3 & 2 \end{cases}$$

1

$m \geq 2 \rightarrow m^2 - 2m - 3 = 0 \begin{cases} m = 3 \\ m = -1 \end{cases}$ if $m < 2 \rightarrow \Delta < 0$ غقق

2

$m \leq 2 \rightarrow -m^2 + 2m + 3 = 0 \begin{cases} m = -1 \\ m = 3 \end{cases}$ if $m > 2 \rightarrow \Delta < 0$ غقق

$$m = 3 \rightarrow y = x^2 + 3x + 2 \rightarrow x_S = -\frac{3}{2}$$

$$m = -1 \rightarrow y = x^2 - x + 2 \rightarrow x_S = -\frac{1}{2}$$