سارینا شیبانی

تاریخ:

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(1) 1.25

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

$a=-2 \quad b=-4 \quad c=31$

$$\left.\begin{array}{l} 1 = 9a + 6a + c \\ 9 = a - 2a + c \end{array}\right\} \; -8 = 16a \to a = -2$$

(2) $2x^2 + mx + (m+6) = 0 \qquad a=2 \quad b=m$

$c = m+6$

$\Delta \geq 0 \to m^2 - 4(2)(m+6) \geq 0 \qquad m^2 - 8m - 48 \geq 0$

$(m-12)(m+4) = 0 \qquad m = 12 \qquad m = -4$

$m \in (-\infty, -4] \cup [12, +\infty)$

$P > 0 \quad P = \frac{c}{a} \quad \frac{m+6}{2} > 0 \to m+6 > 0 \quad m > -6$

$S > 0 = \frac{-b}{a} \quad \frac{-m}{2} > 0 \quad -m > 0 \quad m < 0$

$$\left.\begin{array}{l} m \leq -4 \,,\; m \geq 12 \\ m > -6 \\ m < 0 \end{array}\right\} \xrightarrow{\cap} -6 < m \leq -4 \qquad m \in (-6, -4]$$

(3) $3x^2 + x(2m-1) + (2-m) = 0 \qquad a=3 \quad b=2m-1$

$c = 2-m$

$x_1 + x_2 = \frac{-b}{a} = \frac{-2m+1}{3} \qquad x_1 x_2 = \frac{2-m}{3}$

$x_1 + x_2 = \frac{1}{x_1 x_2} \qquad \frac{2m-1}{3} = \frac{3}{2-m}$

$-4m + 2m^2 + 2 - m = 9 \qquad 2m^2 - 5m - 7 = 0$

$m = \frac{5 \pm \sqrt{81}}{4} \qquad \boxed{m = 7/2} \quad \boxed{m = -1} \to \times$

(4) $x^2 - x - 4 = 0 \qquad x_1 + x_2 = 1 \qquad x_1 x_2 = -4$

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$y_1 = x_2^2 + \frac{1}{x_1} \qquad y_2 = x_1^2 + \frac{1}{x_2} \qquad y^2 - Sy + P = 0$

$S = \underbrace{x_1^2 + x_2^2}_{13} + \underbrace{\frac{1}{x_1} + \frac{1}{x_2}}_{-1/4}$

$13 - 1/4 = 12 + 3/4$

⑤ $x_1^3 + x_2^3$

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$\left(\sqrt[3]{x^4} + \frac{1}{\sqrt[3]{x^2}} + 1\right)\left(\sqrt[3]{x^2} - 1\right) = 2\sqrt[3]{x} = 0$

$2\sqrt[3]{x}$

$\left(x - \frac{2}{x} - \frac{1}{x} = 2\right) \times x$

$x_1 + x_2 = \frac{-b}{a}$ $\qquad x^2 - 2x - 1 = 2x$

(4)

⑥ $x_1 = r \,,\, x_2 = r^3$

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$x_1 x_2 = \frac{4}{9}$ $\qquad 3r^2 = \frac{4}{9}$ $\qquad r^2 = \frac{4}{9}$ $\qquad r = \pm\frac{2}{3}$

$x_1 + x_2 = 4r = \frac{-b}{a}$ $\qquad b = -a$ $\qquad \frac{a}{2}$ $\qquad 4r = \frac{a}{2}$

$a = 12r$ $\qquad r = \frac{2}{3}\; a = 8$ $\qquad r = -\frac{2}{3}$ $\qquad a = -8$ $\qquad 8(-(-8)) = 16$

⑦ $y = ax^2 + (3 + 2a)x$

$x < 0$ $\qquad y > 0$ $\qquad a < -\frac{3}{2}$ $\qquad (2a + 3)^2 > 0$

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$a \neq -\frac{3}{2} \xrightarrow{\text{اشتراک}} -\frac{3}{2} < a < 0$

⑧ $-x^2 - 2x + b \,,\, x^2 + 2x - 3$

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$1 - 2 + b = 1$ $\qquad \frac{-2}{2} = -1$ $\qquad 1 - 2 - 2 = -3$

$b = 4$

$x^2 + 2x - 3 = 1$ $\qquad x^2 + 2x - 3 = 0$

$ab = 8$ $\qquad (x + 3)(x - 1) = 0 \rightarrow -3, 1$

⑨ $2at^2 + at - 9 = 0$ $\qquad 2(t + \frac{1}{2})^2 - a(t + \frac{1}{2}) + b = 0$

$2t^2 + (2 - a)t + \frac{1 - a}{2} + b = 2at^2 + at - 9 = 0$

$\frac{1 - 1}{2} + b = -9$ $\qquad b = -9$

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$\left(\frac{ab}{4}\right) = \frac{-9}{4} = \frac{-3}{2}$

سوال $[\frac{ab}{4}]$ را می‌خواهد! $[\frac{ab}{4}] = [-1,5] = -2$

تاریخ:

(10) $4x = -4x \rightarrow x = -x.$

$x^2 - 6x + x = 0 \quad x^2 = 5x \rightarrow x = 5$

(2) $x^2 + 2x - 15 = 0$

$(x+5)(x-3) = 0 \rightarrow -5, 3$

$x^2 + 6x + 5 \longrightarrow (x+5)(x+1)$

$x \longrightarrow -5, -1$

$3 - (-1) = 4$

$\xrightarrow{\text{راس سهمی}} -\frac{b}{2a} = -1 \rightsquigarrow b = 2a$ ۱

$f(-1) = 9 \to a - b + c = 9 \to a - 2a + c = 9 \to c = 9 + a$

$f(3) = 1 \to 9a + 3b + c = 1 \to 9a + 6a + 9 + a = 1 \to 16a = -8 \to \boxed{a = -\frac{1}{2}} \to \boxed{b = -1},\ \boxed{c = 8/5} \to \boxed{y = -\frac{1}{2}x^2 - x + 8/5}$

$\sqrt[3]{x^2} = t \to (t + \frac{1}{t} + 1)(t - 1) = t^2 - \cancel{t} + \cancel{1} - \frac{1}{t} + \cancel{t} - \cancel{1} = \frac{t^3 - 1}{t}$ ۵

$\frac{x^2 - 1}{\sqrt[3]{x^2}} = 2\sqrt[3]{x} \to x^2 - 1 = 2x \to x^2 - 2x - 1 = 0 \rightsquigarrow S = -\frac{(-2)}{1} = \boxed{2}$

با توجه به معادله سهمی از مبدا می گذرد بنابراین ← ۱. $a > 0$ سهمی مینیمم داشته باشد ۷

۲. یک ریشه ی مثبت و یک ریشه ی صفر داشته باشد

$1) \to \boxed{a > 0}$

$2) \to S > 0 \quad \frac{-2a - 3}{a} > 0 \quad \begin{array}{ccccc} & -1/5 & & 0 & \\ - & & + & & - \end{array} \quad \boxed{-1/5 < a < 0}$

اشتراک این دو بازه تهی است پس غیرممکن است از ناحیه سوم عبور نکند !

$x^2 - x - 4 = 0 \to S = 1,\ P = -4$ ۴

$\boxed{S'} = (x_1^3 + x_2^3) + (\frac{1}{x_1} + \frac{1}{x_2}) \rightsquigarrow S' = S^3 - 3SP + \frac{S}{P} = (1)^3 - (3)(-4)(1) + \frac{1}{-4} = \boxed{-\frac{51}{4}}$

$P' = (x_1 x_2)^3 + x_2^2 + x_1^2 + \frac{1}{x_1 x_2} \to P' = P^3 + S^2 - 2P + \frac{1}{P}$

$\boxed{P'} = (-4)^3 + 1 - 2(-4) - \frac{1}{4} = -64 + 9 - \frac{1}{4} = \boxed{-\frac{221}{4}}$

$x^2 - S'x + P' = x^2 - \frac{51}{4}x - \frac{221}{4}$