۲۰

نمایش سطحی

①

min | ۳/۴ , -۱/۴

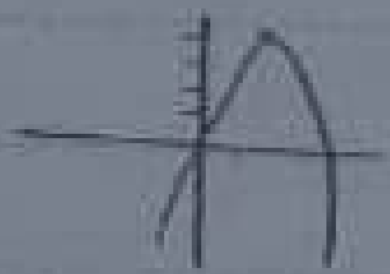
از ناحیه سوم علامت منفی بده

max | ۲ , ٤

از ناحیه دوم علامت مثبت بده

الف)

ب)



②

الف) 

$\min \left| \begin{matrix} 5/4 \\ -9/8 \end{matrix} \right.$

از ناحیه اول، دوم، چهارم عبور می کند

ب) 

$\max \left| \begin{matrix} 2 \\ 3 \end{matrix} \right.$

از ناحیه اول، سوم، چهارم عبور می کند

③

الف) $\frac{\sqrt{13}}{13}$

$\alpha+\beta = -\frac{b}{a} = 1$

$|\alpha-\beta| = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{13}}{1}$

ب) ۷

$\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$\alpha^2+\beta^2 = 1 + 6 = 7$

ج) ۱۰

$\alpha^3+\beta^3 = (\alpha+\beta)^3 - 3\alpha\beta(\alpha+\beta)$

$\alpha^3+\beta^3 = 1 + 9(1) = 10$

د) $4\sqrt{13}$

$\alpha^3-\beta^3 = (\alpha-\beta)^3 + 3\alpha\beta(\alpha-\beta)$

$\alpha^3-\beta^3 = 13\sqrt{13} - 9(\sqrt{13}) = 4\sqrt{13}$

④

$x^2 - ax + a \rightarrow$ نامنفی $\quad \Delta < 0$

$a^2 - 4a < 0$

$a(a-4) < 0 \rightsquigarrow$ (0, 4: + − +)

$a \in (0,4) \quad I$

$x^2 - ax + a = (x-2)^2 \quad x^2 + 4 - 4x \quad a = 4 \quad II$

$\Rightarrow a \in (0,4]$

$S = 12/3 = 4 \qquad P = -a/3$ (۱)

$\alpha + \beta = 4 \Rightarrow \beta = 4 - \alpha$

$2\alpha^2 + (4-\alpha)^2 - 4\alpha = 7$

$2\alpha^2 + 16 + \alpha^2 - 8\alpha - 4\alpha = 7$

$3\alpha^2 - 12\alpha + 16 = 7$

$\alpha^2 - 4\alpha + 3 = 0 \rightsquigarrow (\alpha - 3)(\alpha - 1) = 0$

$\alpha = 3/1$

$3\alpha^2 - 12\alpha + 9 = 0$

$3m^2 - 12m - a = 0$ $\Big\}$ $\Rightarrow a = -9$

$\frac{a}{-2b} = \frac{-9}{3} = -3$

(۲)

$\frac{7 - 2a + 2a + 3}{2} = 5 = b$ $\quad$ $S/\frac{5}{3}$

$(m-a)^2 = -4a(y-3)$ $\xrightarrow{(1,1)}$ $16 = 8a$

$(m-a)^2 = -8(y-3)$ $\quad a = 2$

$(0-a)^2 = -8(y-3)$

$y = 1/8$

$7 - 2a > 0$

$2a + 3 > 0$ $\Big\}$ $\Rightarrow a = 3$

(7)

$S = \frac{a}{a} = 1 \qquad \alpha + \beta = 1 \rightsquigarrow \alpha = 1 - \beta$

$40\beta^2 + 20(1-\beta)^2 - 20\beta - 17 = 0$

$20\beta^2 - 20\beta + 1 = 0 \rightsquigarrow \beta = \frac{10 \pm \sqrt{80}}{20}$

$\alpha - \beta = 1 - 2\beta = \frac{2}{\sqrt{5}}$

(8)

$m_S = \frac{1-5}{2} = -2 \qquad S(-2, -\frac{1}{2})$

$y = a(x-h)^2 + k \qquad S(h, k)$

$y = a(x+2)^2 - \frac{1}{2}$

$(0, \frac{3}{2}) \Rightarrow \frac{3}{2} = a(0-2)^2 - \frac{1}{2}$

$a = \frac{1}{2}$

$(1, \beta) \Rightarrow \beta = \frac{1}{2}(1+2)^2 - \frac{1}{2} = 4$

(9)

$\alpha < \beta < 0 \Rightarrow \alpha - \beta = -\sqrt{5}$

$S = -6 \qquad P = a$

$3\alpha^2 - 2\beta^2 = \frac{5}{2}(\alpha^2 + \beta^2) + \frac{1}{2}(\alpha^2 - \beta^2)$

$\frac{5}{2}(36 - 2a) + \frac{1}{2}(\alpha - \beta)(\alpha + \beta)$

$\left.\begin{matrix} 90 - 5a + 6\sqrt{9-a} \\ 12\sqrt{2} + 85 \end{matrix}\right\} \Rightarrow a = 1$

(10)

$$\frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = 2$$

$$\frac{\sqrt{\alpha}+\sqrt{\beta}}{\sqrt{\alpha\beta}} = 2 \rightsquigarrow \sqrt{\alpha}+\sqrt{\beta} = 2\sqrt{\alpha\beta}$$

$$S + 2\sqrt{P} = 2aP \rightsquigarrow S + 2\sqrt{\frac{1}{4}} = \frac{2a}{4}$$

$$S = \frac{13}{4}$$

$$\frac{m+12}{4} = \frac{13}{4} \rightsquigarrow m = -1$$

$$mx^2 + 4x + 2 = -x^2 + 4x + 1 \rightsquigarrow P = \frac{2}{-1} = -2$$