① الف) $a>0 \rightarrow \min \cup$ $\quad ext\left|\begin{matrix}-\frac{b}{2a}\\ -\frac{\Delta}{4a}\end{matrix}\right.$

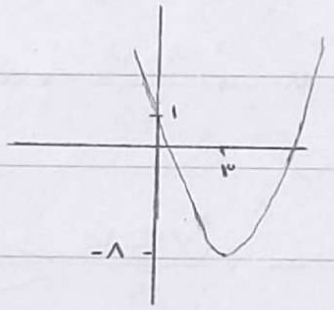
$\frac{4}{4}=1 \qquad \frac{-(14-8)}{8}=-1 \rightsquigarrow ext\left|\begin{matrix}1\\-1\end{matrix}\right.$

ب) $a<0$ $\max \cap$ $\quad \frac{-3}{-4}=\frac{3}{4} \qquad \frac{-(9-40)}{-8}=\frac{-31}{8} \qquad ext\left|\begin{matrix}\frac{3}{4}\\ -\frac{31}{8}\end{matrix}\right.$

② الف) $x=\frac{-b}{2a} \rightarrow \frac{6}{2}=3$

$y=x^2-6x+1 \xrightarrow{x=3} 9-18+1=-8$

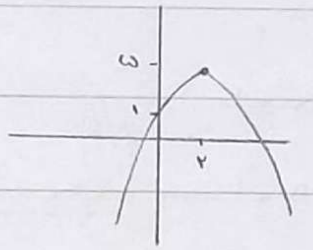
$a>0 \rightarrow \min \cup$



ب) $x=\frac{-b}{2a}=\frac{-4}{-2}=2$

$\xrightarrow{x=2} -4+8+1=5$

$a<0 \rightarrow \max \cap$



③ $\alpha+\beta=-\frac{b}{a}=1 \rightarrow x^2-sx+p=0 \rightarrow \begin{cases} x^2-1-2=0 \\ (x+1)(x-2) \\ x=-1 \quad x=2 \end{cases}$

$\alpha\beta=\frac{c}{a}=-2$

$\xrightarrow{x=2} 32+4k-18-2=0 \rightarrow 12+4k=0 \rightarrow k=-3$

④ $(\sqrt{\alpha}-\sqrt{\beta}=1)^2 \rightarrow \alpha^2+\beta^2-2\sqrt{\alpha\beta}=1 \rightarrow 3m-2\sqrt{m}=1$ اگر α و β ریشه‌ها باشند داریم:

$\xrightarrow{\sqrt{m}=t} 3t^2-2t-1=0 \rightarrow t^2-2t-3=0 \rightarrow \underbrace{(t+1)}_{-\frac{1}{3}}\underbrace{(t-3)}_{1} \rightarrow \sqrt{m}=1 \checkmark \quad \sqrt{m}=-\frac{1}{3}$ غ ق ق

$2x^2-mx-m=0 \xrightarrow{m=1} 2x^2-x-1=0 \xrightarrow{\text{ضرب ریشه‌ها}=\frac{c}{a}} \frac{-1}{2}$

③ $2x^2-(m+2)x+m \xrightarrow{a+b+c=0} x=1 \;,\; x=\frac{m}{2}$ ، هر دو باید بزرگتر از صفر باشند $(0,m)$

$\frac{\text{فاصله ریشه‌ها} \times m}{2} = \frac{1}{2}\left(m\left(\frac{m}{2}-1\right)\right) = \frac{3}{4} \rightarrow \frac{m(m-2)}{4} = \frac{3}{4} \rightarrow m^2-2m-3=0$

$\underbrace{(m+1)}_{m=-1}\underbrace{(m-3)}_{m=3}$ $\xrightarrow{\text{حالت}=\frac{-b}{2a}}$ $x^2-mx+1 \rightarrow \frac{m}{2} \rightarrow \begin{cases} \frac{3}{2} \\ -\frac{1}{2} \end{cases}$

④ $\frac{-b}{2a} = \text{کمترین مقدار} = \frac{-3}{2a} = x \xrightarrow{\text{جایگذاری } x} a\left(-\frac{3}{2a}\right)^2+3\left(-\frac{3}{2a}\right)+a$

$\frac{9a}{4a^2}-\frac{9}{2a}+a \rightarrow \frac{9-18}{4a}+a \rightarrow a-\frac{9}{4a} = \frac{7}{8} \xrightarrow{\times 8a} 8a^2-7a-18=0$

$\Delta = 49+576 \rightarrow \frac{+7 \pm 25}{16} \rightarrow \begin{cases} a=2 \rightarrow y_{min} = \text{کمترین مقدار} = a \text{ ی} \\ a=-\frac{9}{8} \end{cases}$

⑦ اگر ریشه‌ها $= \alpha \rightsquigarrow \alpha, \alpha+2$

$\frac{-b}{a} = a+1 \rightarrow 2\alpha+2 = a+1 \rightarrow 2\alpha+1=a$

$\frac{c}{a} = a \rightarrow \alpha^2+2\alpha = 2\alpha+1 \rightarrow \alpha = \pm 1 \rightarrow$ از طرفی اعداد طبیعی بوده و 1- غ ق ت

$\xrightarrow{x=1}$ $a = 2\times 1+1 = 3$ *

اگر ریشه‌ها $= \beta \rightarrow \beta, \beta+2$

$\frac{-b}{a} = 4\beta+2 \rightarrow 4\beta+2 = 3a+1 \rightarrow 4\beta = 8 \rightarrow \beta = 2$

$\frac{c}{a} \rightarrow 2\beta(2\beta+2) \rightarrow 4(4) = 24 \rightsquigarrow 24-3 = 21$

*

① $y = -ax^2 + ax + 2 \longrightarrow S\left(\frac{1}{2}, \frac{a}{4} + 2\right)$

$y = 2bx^2 - bx - 1 \longrightarrow S\left(\frac{1}{4}, \frac{-b}{8} - 1\right)$

$(2b \times \frac{1}{4}) - (b \times \frac{1}{2}) - 1 = \frac{a+8}{4}$

$\frac{b}{2} - \frac{b}{2} - 1 = \frac{a+8}{4}$

$a + 8 = -4 \longrightarrow a = -12$

$(-a \times \frac{1}{14}) + (\overset{-12}{a} \times \frac{1}{4}) + 2 = \frac{-b}{8} - 1 \xrightarrow{a=-12} \frac{12}{14} - 3 + 2 = -\frac{b}{8} - 1$

$-\frac{b}{8} = \frac{12}{4} \longrightarrow b = -4$

$b - a = -4 + 12 = 4$

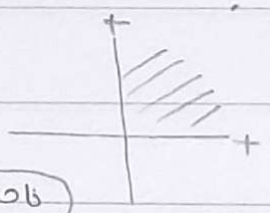
⑨ $\frac{-b}{a} = \alpha + \beta = \frac{-4}{2a} \xrightarrow{*} \alpha = \frac{1}{a} \rightsquigarrow \beta = -1$ / $a = -\frac{1}{a} \rightsquigarrow \beta = 1$

* در این حالت شرط $\beta < \alpha$ قبول است!

$\frac{c}{a} = \alpha\beta = \frac{\beta}{2a} \longrightarrow a^2 = \frac{1}{2a} \xrightarrow{*} a = \pm\frac{1}{a}$

$y = -ax^2 + 4x + 1 \longrightarrow \frac{-b}{2a} = \frac{-4}{-10} = \frac{4}{10}$

$\frac{-\Delta}{4a} = \frac{9}{a}$



ناحیه اول

⑩ $x^2 - \underbrace{(a^2 + b^2 - 12)}_{b} x + \overbrace{a + b - 1}^{c} = 0$

$a + b = \frac{-b}{a} \longrightarrow a^2 + b^2 - 12$

$ab = \frac{c}{a} = a + b - 1$

عبارات را جایگذاری کنید

$(a+b)^2 - 2ab = a^2 + b^2$

$(a+b)^2 - 2(a+b-1) = a + b + 12$

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

$(t+2)(t-5) \longrightarrow \begin{matrix} a+b=-2 \\ a+b=5 \end{matrix}$