$\alpha+\beta=5, \alpha\beta=2$

$\alpha=5-\beta$

-۱

$\beta^2=5\beta-2 \rightarrow \beta^3=5\beta^2-2\beta=5(5\beta-2)-2=23\beta-10$

$\beta^4=23\beta^2-10\beta=23(5\beta-2)-10\beta=105\beta-46 \rightarrow \beta^5=105\beta^2-46\beta=525\beta-210$

$\frac{2\alpha+\beta^5}{5\beta^2}=\frac{2(5-\beta)+525\beta-210}{5(5\beta-2)}=\frac{10-2\beta+525\beta-210}{25\beta-10}=\frac{515\beta-200}{25\beta-10}=$

$\frac{95(5\beta-2)}{5(5\beta-2)}=19$

-۲ y مرد $=$

$x=\frac{-b}{2a}=\frac{-1.5}{2}=0.75 \rightarrow \frac{-b}{2a}=x=0.75$

$\rightarrow \frac{b}{a}=-1.5 \rightarrow \alpha+\beta=\frac{-b}{a}=-(-1.5)=1.5$

-۳

$|\alpha-\beta|=\frac{\sqrt{\Delta}}{|a|}=\sqrt{\frac{4(k^2-5)}{1}}=2\sqrt{k^2-5}=\frac{3}{2}k \rightarrow \sqrt{k^2-5}=\frac{3}{4}k \rightarrow k^2-5=\frac{9}{16}k^2$

$\rightarrow 5=\frac{7}{16}k^2 \rightarrow k^2=16 \rightarrow \left[\frac{k^2}{2}\right]=\left[\frac{16}{2}\right]=8$

-۴

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

$\alpha+\beta=-2 \rightarrow x=\frac{-2}{2}=-1$

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

$y=a(x^2+2x-\frac{1}{2}) \rightarrow 1=a(1-2-\frac{1}{2}) \rightarrow a=-\frac{2}{3} \rightarrow y=-\frac{2}{3}(x^2+2x-\frac{1}{2}) \Rightarrow y=\frac{1}{3}$

$y=\frac{1}{3}$

-۵

$\alpha+\beta=5$ — مرتبه‌ی $\frac{\alpha+\beta}{2}=2.5$

① $\rightarrow \Delta \geq 0 \rightarrow 25+4m \geq 0 \rightarrow 4m \geq -25 \rightarrow m \geq -6.25$

② $\rightarrow f(\frac{5}{2}) \geq 0 \rightarrow (\frac{5}{2})^2-5(\frac{5}{2})-m \geq 0 \rightarrow m \leq -2.25$

$-6.25 \leq m \leq -2.25$ $\{-6, -5, -4, -3\}$

$\frac{-\Delta}{4a} = \frac{144 - 4m(am-1)}{4m} = \frac{m(am-1)-24}{m} < 2 \rightarrow am^2 - 2m - 24 = 0$

$(m-3)(am+12) = 0$

$m < 3$ ✓ $\quad -\frac{12}{a} < 3 \quad m > 0$

$y = 2x^2 - 12x + 14$

رأس السهم $x = \frac{-b}{2a} = \frac{12}{4} = 3$ (2)

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

$\alpha\beta = \frac{c}{a} = 2a - 1$

$a^2 = \alpha\beta \leftarrow \beta, a, \alpha$

$a^2 = 2a - 1$

$a^2 - 2a + 1 = 0 \leftarrow (a-1)^2 = 0$ $\quad (a = 1$ ✗ $)$

$x^2 = \frac{7 \pm \sqrt{49 + 20}}{2} \rightarrow x = \pm\sqrt{\frac{7 + \sqrt{69}}{2}}$

$S = 0$

$P = -\frac{7 + \sqrt{69}}{2}$

$2P^2 - 5P + 25 = 2 \times \frac{49 + 69 + 14\sqrt{69}}{4}$

$\boxed{35 + 7\sqrt{69}} = \boxed{35 + 7\sqrt{69}}$

$\text{ext} \begin{cases} x = \frac{-4}{2k} = \frac{-2}{k} \\ y = k\left(\frac{2}{k}\right)^2 - 4\left(\frac{2}{k}\right) - 9 = \frac{4}{k} - 9 \end{cases} \rightarrow \begin{vmatrix} -20 \\ \frac{-4}{k} \\ \frac{-4}{k} - 9 \end{vmatrix}$

$y = -4x - 4$

$\frac{-4}{k} - 9 = -4\left(\frac{2}{k}\right) - 4 \rightarrow \frac{4}{k} = 2 \rightarrow k = 2$ $\quad y = \frac{-4}{k} - 2 = -4$ (-4)

$-m - x = -mx^2 + mx + 1$

$mx^2 - mx - m - x - 1 = 0$

$mx^2 + x(-m-1) - (m+1) = 0$

$\Delta < 0 \quad (-(m+1))^2 - 4m \times -(m+1) < 0$

$m^2 + 1 + 2m + 4m^2 + 4m < 0$

$5m^2 + 6m + 1 < 0$

$(5m+1)(m+1) < 0$

$-\frac{1}{5}$ $\quad -1$

$+ \; + \; - \; +$

$\boxed{-1 < m < -0.2}$