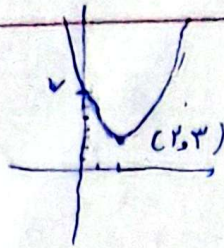


الف) $\Delta < 0$ و $\Delta = 0$

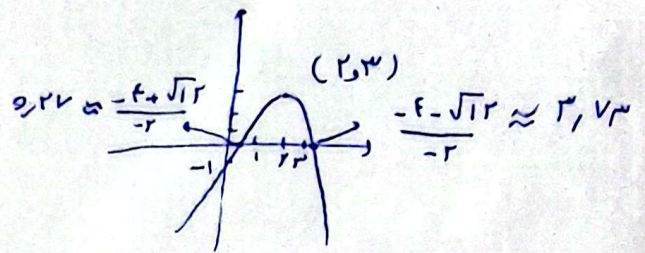
$$\frac{-b}{2a} = \frac{-\frac{1}{2}}{2} = -\frac{1}{4} < 0 \quad \text{و} \quad \Delta = \left(\frac{1}{2}\right)^2 - 4 \cdot \frac{1}{2} \cdot \frac{1}{2} = -1 < 0$$



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ب) $a < 0$ و $\frac{-b}{2a} = \frac{-\frac{1}{2}}{2} = -\frac{1}{4} < 0$ و $\Delta = 0$

$$\Delta = 0 \Rightarrow x = \frac{-\frac{1}{2} \pm \sqrt{0}}{2} = -\frac{1}{4}$$



$$\Delta > 0 \Rightarrow (m+1)^2 - f\left(\frac{1}{m+1}\right) > 0 \Rightarrow m^2 - 2m - 1 < 0 \Rightarrow \frac{-2 \pm \sqrt{4+4}}{2} = -1 \pm \sqrt{2}$$

$$\Delta = 0 \Rightarrow (m+1)^2 - f\left(\frac{1}{m+1}\right) = 0 \Rightarrow m^2 - 2m - 1 = 0 \Rightarrow m = 1 \pm \sqrt{2}$$

$$\Delta < 0 \Rightarrow (m+1)^2 - f\left(\frac{1}{m+1}\right) < 0 \Rightarrow m^2 - 2m - 1 < 0 \Rightarrow \frac{-2 \pm \sqrt{4+4}}{2} = -1 \pm \sqrt{2}$$

$$\Delta > 0 \Rightarrow (m+1)^2 - f\left(\frac{1}{m+1}\right) > 0 \Rightarrow m^2 - 2m - 1 > 0 \Rightarrow \frac{-2 \pm \sqrt{4+4}}{2} = -1 \pm \sqrt{2}$$

$$K < 0 \Rightarrow \frac{m+1}{m-1} < 0 \Rightarrow \frac{1}{m-1} < 0 \Rightarrow m > 1$$

$$P > 0 \Rightarrow \frac{1}{m-1} > 0 \Rightarrow m < 1$$

$$|A| > |B| \Rightarrow K < 0 \Rightarrow \frac{m+1}{m-1} < 0 \Rightarrow \frac{1}{m-1} < 0 \Rightarrow m > 1$$

$$P < 0 \Rightarrow \frac{1}{m-1} < 0 \Rightarrow m < 1$$

$$\Delta > 0 \Rightarrow f(m^2 + 1) - f(m+1) > 0 \Rightarrow f(m^2 - 2m - 1) > 0 \Rightarrow m^2 - 2m - 1 > 0$$

$$\Delta < 0 \Rightarrow m^2 - 2m - 1 < 0$$

$$\frac{1}{m-1} < 0 \Rightarrow \frac{1}{m-1} < 0 \Rightarrow m < 1$$

$$\frac{-b}{2a} = \frac{-\frac{1}{2}}{2} = -\frac{1}{4} < 0 \Rightarrow \frac{1}{m-1} < 0 \Rightarrow m < 1$$

$$m = 1 \pm \sqrt{2}$$

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$$(P \sin \alpha)^r = f \left(\frac{P}{f} \right) \left(\frac{P}{f} \right) \Rightarrow f \sin \alpha \geq 1 \rightarrow \sin \alpha \geq \frac{1}{f} \rightarrow \sin \alpha \leq 1$$

$$\Rightarrow \sin \alpha = 1 \rightarrow \sin \alpha = 1$$

$$\begin{cases} \sin \alpha = 1 \Rightarrow \frac{P}{f} n^r = P_m + P_f \Rightarrow \delta = f - 1 \times \frac{P}{f} \times \frac{P}{f} \Rightarrow \frac{P \pm \sqrt{P}}{f} = \boxed{\frac{P}{f}} \text{ (5)} \\ \sin \alpha = 1 \Rightarrow \frac{P}{f} n^r + P_m + P_f \Rightarrow 0 = f - 1 \times \frac{P}{f} \times \frac{P}{f} \Rightarrow \frac{-1 \pm \sqrt{1}}{f} = -\frac{P}{f} \text{ (5)} \end{cases}$$

$$\frac{(P_m^r - P_{m-1}) (P_n^r - P_{n-1})}{1 - n^r} = \frac{(P_m - 1)(n - 1)(n + 1)(P_n + 1)}{(1 - n)(1 + n)}$$

$$\Rightarrow -P_m^r + P_m + 0 \leq 0$$

$$\Rightarrow -n^r + \frac{1}{n} + \frac{1}{n} \Rightarrow \frac{-\Delta}{1a} = \boxed{\frac{1}{n}} \text{ (5)}$$

$$P(\alpha + \beta) = 0 (\alpha + \beta + 1) \Rightarrow \frac{P_m + 1}{m} = \frac{-1 + 1}{m} \Rightarrow m = f$$

$$\alpha^r + \beta^r = 5^r - 2P = \left(\frac{5+r}{f} \right)^r - 2 \left(\frac{-1}{f} \right) = \frac{r^2}{14} + 1 = \frac{1}{f} + 1 = \boxed{\frac{1}{f}} \text{ (5)}$$

$$a\beta = \frac{c}{a} \Rightarrow f = a\beta^r \Rightarrow \beta^r = \frac{f}{a} \Rightarrow \frac{fa + \beta^a}{a\beta^r} = \frac{fa}{a\frac{f}{a}} + \frac{\beta^r}{\frac{f}{a}} \Rightarrow \frac{a^r}{a} + \frac{\beta^r}{a} = \frac{a^r + \beta^r}{a}$$

$$\Rightarrow \frac{5^r - 2P}{1} = \frac{120 - 2P}{a} = \frac{90}{a} = \boxed{19} \text{ (5)}$$

$$c \neq f \Rightarrow ax^r + bx + f = 0 \Rightarrow r(r) + 1 = fa + rb + f, r(-r) + 1 = 9a - rb + f$$

$$r + 1f = fa + rb + f$$

$$r + f = 9a - rb + f$$

$$\frac{-b}{1a} = \text{موزنارن} \Rightarrow \boxed{\frac{r}{f}} = \boxed{1.5} \text{ (5)}$$

$$\begin{cases} fr = 12a + 4b + 1 \\ 1 = 11a - 4b + 1 \end{cases} \Rightarrow \begin{cases} a = 1 \\ b = 3 \end{cases}$$

$$P_m^r + (m+1)P_m + m + 1 = P_m^r + m + m + 1 \Rightarrow \Delta = 0 \Rightarrow m^r - 1m - 1 = 0$$

$$y = m \Rightarrow \Delta = 0 \Rightarrow m = 0$$

$$\Rightarrow \frac{1+1}{1} = \frac{1-1}{1} \Rightarrow \boxed{1, -1} \text{ (5)}$$

برای هم آید و هم آید تا قبل است .
 $\Delta = 9 + 4(-1 \times 1) = 25 = 5 \times 5$
 $\Delta = 129 - 1 \times 1 \times 1 = 129 - 1 = 128 = 2 \times 64 = 2 \times 8^2 = 16 \times 8 = 128$