

$$y = (a-1)n^2 + m + 3$$

$$\frac{1}{n^2} \sim \frac{1}{n^2} \rightarrow \frac{-b}{2a} = 2 \rightarrow \frac{1}{2-2a} = 2 \rightarrow a = \frac{3}{4}$$

$$\Rightarrow y = \frac{1}{4}n^2 + m + 3$$

$$\rightarrow \frac{1}{4}n^2 + m + 3 = 0 \rightarrow n^2 - 4m - 12 = 0 \rightarrow (n-4)(n+2) = 0 \rightarrow \boxed{n=4} \rightarrow m = -2$$

نکته: در این حالت مثبت نیست

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$$f(m) = mn^2 \Delta m + m$$

n	n ₁	n ₂
f(n)	-	+

$$\Rightarrow m < 0 \quad \textcircled{1}$$

$$\Delta > 0 \rightarrow 4a - 4m^2 > 0 \rightarrow m^2 < \frac{4a}{4} \rightarrow -\frac{a}{2} < m < \frac{a}{2} \quad \textcircled{2}$$

$$\textcircled{1} \cap \textcircled{2} \rightarrow \boxed{-\frac{a}{2} < m < \frac{a}{2}}$$

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$$S = \frac{3-\sqrt{5}}{2} + \frac{3+\sqrt{5}}{2} = 3$$

$$P = \left(\frac{3-\sqrt{5}}{2}\right) \left(\frac{3+\sqrt{5}}{2}\right) = \frac{4}{4} = 1$$

$$\Rightarrow n^2 - Sn + P = 0 \rightarrow \boxed{n^2 - 3n + 1 = 0} \Rightarrow \boxed{9n^2 - 11n + 4 = 0}$$

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$$4n^2 - 11n + 4 = 0 \rightarrow S = 3, P = \frac{4}{4} = 1$$

$$\alpha < \beta$$

$$4\alpha^2 + \beta^2 = 12 \rightarrow 4\alpha^2 + 4\beta^2 + \alpha^2 - \beta^2 = 12 \rightarrow 4(\alpha^2 + \beta^2) + (\alpha - \beta)(\alpha + \beta) = 12$$

$$\Rightarrow 4(14 - m - 2) + \sqrt{49 - 14m - 4} = 12 \rightarrow 14 - m - \sqrt{45 - 14m} = 4$$

$$\Rightarrow -\sqrt{45 - 14m} = m - 10 \rightarrow 45 - 14m = m^2 - 20m + 100 \rightarrow m^2 - 14m + 55 = 0$$

$$\Rightarrow (m-5)^2 = 0 \rightarrow \boxed{m=5}$$

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$$S(2,9) \rightarrow y = a(n-2)^2 + 9 \quad \Delta = 4a + 9 \rightarrow a = -1$$

$$A(0,9)$$

$$\Rightarrow y = -n^2 + 4n + 9 \rightarrow -n^2 + 4n + 9 > 0 \rightarrow n^2 - 4n - 9 < 0$$

$$\rightarrow (n-5)(n+1) < 0 \quad \frac{-1}{+4} \quad \frac{9}{-1} \Rightarrow \boxed{n \in (-1, 5)}$$

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$$\alpha n^r - v m + 9 \beta z = 0$$

$$\xrightarrow{n=\beta} \alpha \beta^r - v \beta + 9 \beta z = 0 \rightarrow \alpha \beta^r + 9 \beta z = 0 \rightarrow \beta(\alpha \beta + 9) = 0 \rightarrow \alpha \beta = -9$$

$\beta = 0 \rightarrow \alpha = -9$
 $\alpha \beta = -9$

$$\xrightarrow{n=\alpha} \alpha^r - v \alpha + 9 \beta z = 0 \xrightarrow{\beta = \frac{-r}{\alpha}} \alpha^r - v \alpha - \frac{1}{\alpha} = 0 \rightarrow \alpha^2 - v \alpha - 1 = 0$$

$$\xrightarrow{\alpha^r = t} t^r - v t - 1 = 0 \rightarrow (t-9)(t+1) = 0 \rightarrow t = 9 \rightarrow \alpha = 9$$

$$\rightarrow t = 9 \rightarrow \alpha = 9 \rightarrow \alpha z \pm 9 \frac{\alpha \beta + 9}{\beta} = 0 \rightarrow \alpha z \pm 9 \frac{-9 + 9}{\beta} = 0 \rightarrow \alpha z = 0$$

$\boxed{\beta = \frac{-r}{\alpha}}, \boxed{\alpha = 9}$

$$z) \frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{-9} + \frac{1}{\frac{-r}{-9}} = \boxed{\frac{v}{9}}$$

$$n^r + m m - r m = 0 \rightarrow S = -m, \beta = -r m$$

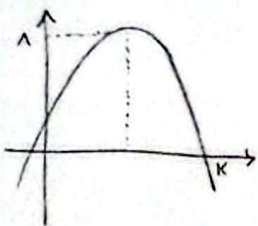
$$\xrightarrow{n=\beta} \beta^r + m \beta - r m = 0 \rightarrow -m \beta = \beta^r - r m$$

$$\alpha^r - m \beta = 1 \xrightarrow{-m \beta = \beta^r - r m} \alpha^r + \beta^r - r m = 1 \rightarrow m^r + r m - r m = 1 \rightarrow m^r + r m - 1 = 0$$

$$\rightarrow (m+r)(m-r) = 0 \rightarrow m = r \rightarrow n^r + r m - r = 0 \rightarrow \boxed{r = -1}$$

$\rightarrow m = -r \rightarrow n^r - r m + 1 = 0 \rightarrow \Delta = 0$

$$f(m) = m n^r + r m + \frac{m}{r} + v$$



$$z) \frac{-\Delta}{4a} = 1 \rightarrow \frac{-(14 - r m^r - r m)}{r m} = \frac{r m^r + r m - 14}{r m} = 1$$

$$\rightarrow r m^r - r m - 14 = 0 \rightarrow m^r - r m - 1 = 0 \rightarrow (m-r)(m+r) = 0$$

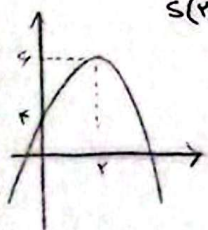
$$\rightarrow \boxed{m = -r}$$

$$\rightarrow m = -r \rightarrow \text{further calculation}$$

$$z) f(m) = -r m^r + r m + 4$$

$$\xrightarrow{\frac{-b}{2a}} -r m^r + r m + 4 = 0$$

$$\rightarrow \boxed{m = \frac{4}{r} = 4}$$



$$S(4, 4) \rightarrow y = a(m-r)^r + 4 \rightarrow x = 4a + 4 \rightarrow a = -\frac{1}{r}$$

$$A(0, 4)$$

$$z) y = \frac{1}{r} n^r + r m + 4 \rightarrow -\frac{1}{r} n^r + r m + 4 = 0$$

$$\rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha \beta} = \frac{5}{p} = \frac{\frac{-r}{\frac{-r}{\alpha}}}{\frac{r}{\frac{-r}{\alpha}}} = \boxed{\frac{-1}{r}}$$

$$n^r - (f a + f) n + (r a^r + 9 a + 3) = 0 \xrightarrow{n=r} r - 1 a - 1 + r a^r + 9 a + 3 = 0$$

$$z) r a^r - r a - 1 = 0 \rightarrow a = 1 \rightarrow a = \frac{1}{r}$$

$$\xrightarrow{a=1} n^r - 1 n + 1 = 0 \rightarrow p = 1, \alpha = 1 \rightarrow \boxed{\beta = \frac{1}{r} = 1}$$

$$\xrightarrow{a=\frac{1}{r}} n^r - \frac{1}{r} n + \frac{r}{r} = 0 \rightarrow p = \frac{r}{r}, \alpha = 1 \rightarrow \boxed{\beta = \frac{r}{r} = \frac{r}{r}}$$