

$$\max x = 7 \rightarrow \frac{\Delta}{\varepsilon a} = 7$$

$$\Delta = b^2 - \varepsilon(-1)(12) = b^2 + 12$$

$$\frac{-\Delta}{\varepsilon a} = \frac{-b^2 - 12}{-\varepsilon} = \frac{b^2 + 12}{\varepsilon} = 7 \rightarrow b^2 + 12 = 7\varepsilon \Rightarrow b^2 = 14$$

$$b = \pm \sqrt{14}$$

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الف) $x^2 + 2x + 3 \xrightarrow{x'=t} t^2 + 2t + 3 = 0 \quad \Delta = 4 - 4(3) = -8 \Rightarrow \Delta < 0$

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ب) $f(m) = (\varepsilon - m^2)^2 - 2(\varepsilon - m^2) - 12 \xrightarrow{(\varepsilon - m^2) = t} t^2 - 2t - 12 = 0 \Rightarrow (t+3)(t-6) = 0 \Rightarrow t = -3, 6$

$$\begin{cases} \varepsilon - m^2 = -3 \rightarrow m^2 = 7 \Rightarrow m = \pm\sqrt{7} \\ \varepsilon - m^2 = 6 \rightarrow m^2 = -1 \quad \text{غیرممکن} \end{cases}$$

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$$3m^2 - 4m + m = 0$$

$$\alpha = \beta + 2 \leftarrow \beta, \alpha = \text{مقادیر صحیح}$$

$$\alpha + \beta = 5 = \frac{-b}{a} = \frac{14}{\varepsilon} = \varepsilon \xrightarrow{\alpha = \beta + 2} \beta + 2 + \beta = \varepsilon \Rightarrow 2\beta + 2 = \varepsilon \rightarrow 2\beta = \varepsilon - 2 \rightarrow \beta = 1$$

$$\alpha = 1 + 2 = 3$$

$$P = \alpha \cdot \beta = \frac{c}{a} \rightarrow \frac{m}{\varepsilon} = \frac{1 \times 3}{\varepsilon} \Rightarrow m = 12$$

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$$3m^2 - 4m + m - 1 = 0$$

$$2\alpha - \beta = \varepsilon \Rightarrow \beta = 2\alpha - \varepsilon$$

$$\alpha + \beta = \frac{-b}{a} = \frac{4}{\varepsilon} = 2 \xrightarrow{\beta = 2\alpha - \varepsilon} \alpha + 2\alpha - \varepsilon = 2 \Rightarrow 3\alpha = 2 + \varepsilon \Rightarrow \alpha = 2$$

$$\beta = 2 \times 2 - \varepsilon = 0$$

$$\alpha \cdot \beta = \frac{c}{a} \rightarrow 2 \times 0 = \frac{m-1}{\varepsilon} \Rightarrow m-1 = 0 \Rightarrow m = 1$$

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$$-m^2 + \varepsilon m + m - 2 = 0$$

$$x = \frac{1}{\beta} \rightarrow \alpha\beta = 1 = \frac{c}{a} \rightarrow \frac{m^2 - 2}{-m} = 1 \rightarrow m^2 - 2 = -m \Rightarrow m^2 + m - 2 = 0$$

$$\Rightarrow (m+2)(m-1) \Rightarrow m = -2, m = 1$$

$$m = -2 \rightarrow 2x^2 + \varepsilon x + 2 = 0 \Rightarrow x = -1 \quad \text{ریشه صحیح}$$

$$m = 1 \rightarrow -x^2 + \varepsilon x - 1 = 0 \Rightarrow x = \frac{-\varepsilon \pm \sqrt{\varepsilon^2 - 4}}{-2}$$

ریشه صحیح

$$\Rightarrow m = 1$$

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$$x^r - mx + r = 0$$

$$\alpha\beta = \varepsilon \rightarrow \alpha\beta(\beta) = \varepsilon \rightarrow \beta = \frac{\varepsilon}{\alpha} \quad \alpha\beta = r \rightarrow \alpha \times \frac{\varepsilon}{\alpha} = r \Rightarrow \alpha = \frac{r}{\frac{\varepsilon}{\alpha}} = \frac{q}{\varepsilon}$$

$$\alpha + \beta = \frac{-b}{a} = \frac{m}{1} = \frac{\varepsilon}{r} + \frac{q}{\varepsilon} = \frac{14 + 21}{12} = \frac{35}{12}$$

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$$x^r - \varepsilon n + m = 0$$

$$\alpha = r\beta \quad \alpha + \beta = \frac{-b}{a} = \frac{\varepsilon}{1} \xrightarrow{\alpha=r\beta} r\beta + \beta = \varepsilon \Rightarrow \varepsilon\beta = \varepsilon \Rightarrow \beta = 1, \alpha = r$$

$$\alpha \cdot \beta = \frac{c}{a} = m = 1 \times r = r \quad \boxed{m = r}$$

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$$x^r - vx + r = 0 \xrightarrow{x=\alpha} \alpha^r - v\alpha + r = 0 \Rightarrow \alpha^r + r = v\alpha \xrightarrow{\div \alpha} \alpha + \frac{r}{\alpha} = v$$

$$\alpha^r + \frac{r}{\alpha^r} \rightarrow \left(\alpha + \frac{r}{\alpha}\right)^r = \alpha^r + \frac{r}{\alpha^r} + \underbrace{r\alpha\left(\frac{r}{\alpha}\right)}_r \underbrace{\left(\alpha + \frac{r}{\alpha}\right)}_v = v^r$$

$$\alpha^r + \frac{r}{\alpha^r} = v^r \Rightarrow v^r - \varepsilon r = \boxed{301}$$

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$$h(t) = -10t^r + \omega \cdot t \rightarrow y_{\max} = \frac{-(r\omega - 2(-1))}{-2} = \frac{r\omega}{2} = \boxed{4, r\omega}$$

$$-10t^r + \omega t = 0 \rightarrow t(-10t + \omega) = 0 \rightarrow t = 0, t = \omega$$

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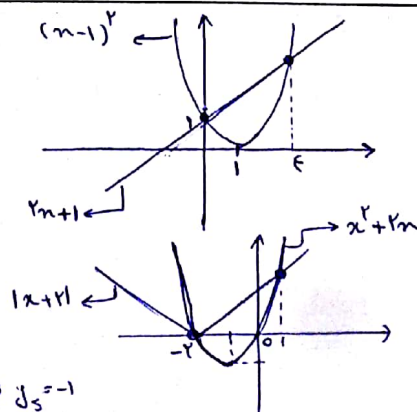
$$\omega) (n-1)^r = r_{n+1} \quad y = (x-1)^r \rightarrow x=1, y=0$$

$$x^r - r_{n+1} = r_{n+1} \rightarrow x^r - \varepsilon = 0 \Rightarrow x = 0, x = \varepsilon$$

$$\omega) x^r + r_n = |n+r|$$

$$x^r + r_n = x + r \rightarrow x^r + n - r = 0 \Rightarrow n = -r, n = 1$$

$$x^r + r_n \rightarrow x(n+r) = 0 \rightarrow x = 0, n = -r \quad x_5 = -1, y_5 = -1$$



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 $x=0, x=\varepsilon$

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 $x=-r, x=1$

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