

$$\rightarrow \frac{-\Delta}{fa} = V \rightarrow \frac{-(b^2 + 12)}{4} = V \rightarrow b^2 + 12 = 21 \rightarrow b^2 = 9 \rightarrow b < \frac{f}{f}$$

$$b=f \rightarrow y = -x^2 - 4x + 3 \rightarrow \frac{-b}{2a} = \frac{f}{-2} = -2 \rightarrow -4 + 1 + 3 = 0$$

$$b=f \rightarrow y = -x^2 + 4x + 3 \rightarrow \frac{-b}{2a} = \frac{-f}{-2} = 2 \rightarrow -4 + 1 + 3 = 0$$

الف)  $y = x^2 + 2x^2 + 3 \quad t = x^2 \rightarrow t^2 + 2t + 3 = 0$   
 $\Delta = 4 - 12 < 0$  ← جواب ندارد

ب)  $f \cdot x^2 = t \rightarrow t^2 - 2t - 12 = 0$   
 $(t-4)(t+3) = 0$   
 $t=4 \rightarrow f \cdot x^2 = 4 \rightarrow x^2 = -1 \times$   
 $t=-3 \rightarrow f \cdot x^2 = -3 \rightarrow x^2 = V \Rightarrow x = \pm \sqrt{V}$

$$y = 4x^2 - 14x + m = 0$$

$$\rightarrow \text{ریشه ها} = \alpha \text{ و } \alpha + 2$$

$$y = 4x^2 - 14x + 12 = 0$$

$$\uparrow \alpha + b + c = 0 \rightarrow \text{ریشه ها حالت اول} = 1, \frac{12}{4} = 3$$

$$\rightarrow P = \alpha(\alpha + 2) = 1(3) = 3 \Rightarrow \frac{c}{a} = 3 \rightarrow m = 12$$

$$\rightarrow S = \alpha + \alpha + 2 = 2\alpha + 2 = \frac{14}{4}$$

$$\rightarrow 2\alpha + 2 = 4 \rightarrow 2\alpha = 2 \rightarrow \alpha = 1$$

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

$$\rightarrow S = \alpha + \beta = \frac{4}{3} = 2$$

$$\begin{cases} 2\alpha - \beta = 4 \\ \alpha + \beta = 2 \end{cases} \rightarrow 3\alpha = 6 \rightarrow \alpha = 2 \rightarrow \beta = 0$$

$$P = 0 \rightarrow \frac{m-1}{3} = 0 \Rightarrow m-1 = 0 \rightarrow m = 1$$

$$y = -mx^2 + 4x + m^2 - 4 = 0$$

$$\rightarrow \text{ریشه ها} = \alpha \text{ و } \frac{1}{\alpha}$$

$$\rightarrow P = \alpha \times \frac{1}{\alpha} = 1 \Rightarrow \frac{m^2 - 4}{-m} = 1 \rightarrow m^2 - 4 = -m \rightarrow m^2 + m - 4 = 0 \rightarrow (m+2)(m-1) = 0$$

$$\frac{m=1}{m=-2} \rightarrow -x^2 + 4x - 1 = 0 \rightarrow \Delta > 0 \rightarrow m = 1$$

$$\frac{m=-2}{m=-2} \rightarrow 2x^2 + 4x + 2 = 0 \rightarrow \Delta = 0 \rightarrow \text{یک ریشه دارد.}$$

$$y = x^2 - m x + 3 = 0$$

$$\rightarrow \alpha \beta^2 = 3 \rightarrow \underbrace{\alpha \beta}_{\beta} (\beta) = 3$$

$$P = \frac{c}{a} = 3$$

$$S = \frac{-m}{1} = m = \alpha + \beta$$

$$\rightarrow \alpha \beta = 3 \rightarrow \alpha = \frac{3}{\beta} = \frac{9}{4}$$

$$\beta = \frac{4}{3}$$

$$\rightarrow m = \alpha + \beta = \frac{14 + 27}{12} = \frac{41}{12}$$

$$y = x^2 - 4x + m = 0 \xrightarrow{\text{ریشه ها}} \alpha, 3\alpha$$

$$\rightarrow S = 4, P = m$$

$$\rightarrow \alpha + 3\alpha = 4\alpha = 4 \rightarrow \alpha = 1$$

$$\rightarrow \alpha \times 3\alpha = 3\alpha^2 = 3(1) = 3 \Rightarrow m = 3$$

$$y = x^2 - 7x + 2 = 0 \xrightarrow{\times \frac{1}{x}} x - 7 + \frac{2}{x} = 0 \rightarrow x + \frac{2}{x} = 7 \rightarrow \alpha + \frac{2}{\alpha} = 7$$

$$\rightarrow \alpha^3 + \frac{1}{\alpha^3} = ?$$

$$(\alpha + \frac{2}{\alpha})^3 = 7^3 \rightarrow \alpha^3 + \frac{1}{\alpha^3} + 3\alpha \times \frac{2}{\alpha} (\alpha + \frac{2}{\alpha}) = 343$$

$$\hookrightarrow \alpha^3 + \frac{1}{\alpha^3} = 343 - 42 = 301$$

$$y = -10t^2 + 40t$$

در آن نیت که باز می خوردی کند  $t < 0$

زمانی که توپ باز می خوردی کند  $-10t^2 + 40t = 0 \rightarrow 10t(-t + 4) = 0$

ارتفاع ماکسیمم  $\frac{b}{2a} = \frac{-40}{-20} = 2$  جایگذاری  $-10(\frac{20}{1}) + 40(\frac{20}{1}) = -40 + 160 = 120$

الف)

