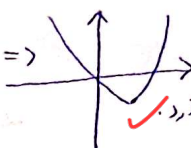
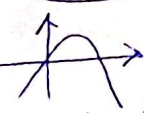



الف)  $y = 3x^2 - 2x = x(3x - 2) = 0 \Rightarrow x = \begin{cases} \frac{2}{3} \\ 0 \end{cases} a > 0$   از ناحیه سوم نمیگذرد. ✓

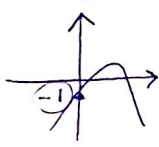
۲

ب)  $y = -x^2 + 4x = x(-x + 4) = 0 \Rightarrow x = \begin{cases} 4 \\ 0 \end{cases} a < 0$   از ناحیه دوم نمیگذرد. ✓

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الف)  $2x^2 - 3x + 2 = 0 \Rightarrow x = \begin{cases} \frac{3}{4} \\ \frac{1}{2} \end{cases} a > 0, c = 2$   از نواحی ۱ و ۲ و ۴ نمیگذرد. ✓

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ب)  $-x^2 + 4x - 1 = 0 \Rightarrow P > 0, S > 0, a < 0, c = -1$   از نواحی ۱ و ۲ و ۴ نمیگذرد. ✓

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الف)  $\frac{\alpha + \beta}{\alpha - \beta} = \frac{S}{\Delta} = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$  ✓  $\left\{ \begin{array}{l} \text{اختلاف مثبت} \\ \sqrt{13} = \frac{1}{11} = \frac{1}{13}, P = -3, S = 1 \end{array} \right.$

ب)  $\alpha^2 + \beta^2 = S^2 - 2P = 1 + 4 = 5$  ✓

ج)  $\alpha^3 + \beta^3 = S^3 - 3SP = 1 + 9 = 10$  ✓

د)  $\alpha^3 - \beta^3 = (\alpha - \beta)(\alpha^2 + \alpha\beta + \beta^2) = (\alpha - \beta)(S^2 - 2P + P) = \sqrt{13}(1 + 3) = 4\sqrt{13}$  ✓

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$(x-2)(x^2 - ax + a) = 0, x = 2 \rightarrow x^2 - ax + a = 0 \xrightarrow{x=2} x^2 - 2x + 4 = 0 \Rightarrow \alpha = 4$  \*

$\rightarrow x^2 - ax + a = 0 \xrightarrow{\Delta < 0} a^2 - 4a < 0 \Rightarrow \frac{4}{+1} = \frac{4}{+1} \Rightarrow a = (0, 4)$  \*

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$a = * \cup * = (0, 4)$  ✓

$3x^2 - 12x - a = 0 \Rightarrow S = 4, P = \frac{-a}{3} \Rightarrow \alpha^2 + S^2 - 2P - 4\alpha = \alpha^2 + 16 - 2P - 4(\alpha + \beta) = 7$

$-2P = -9 \Rightarrow -2(\frac{-a}{3}) = -9 \Rightarrow a = -9$  ✓  $\alpha^2 - 2P - P = -9$

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$\Rightarrow 3x^2 - 12x + 9 = 0 \Rightarrow x = \begin{cases} 1 \leftarrow x_1 \\ 3 \leftarrow x_2 \end{cases}$   $\frac{x_1}{a} = \frac{3}{-9} = -\frac{1}{3} \Rightarrow \frac{a}{x_2} = -3$  ✓

دریم جمع مزدون نقطه با عرض برابر در سمت راست  $\Leftrightarrow$   $(\sqrt{r-2a}) + (\sqrt{r+2a}) = 1 \Rightarrow S = \omega \Rightarrow$   $\omega = \frac{b}{-a} = -1 \Rightarrow b = -1 \cdot a = -a \Rightarrow a^2 - 1 \cdot a + c = 0$

$\left. \begin{array}{l} \text{و اولی قابل} \\ \text{تکلیلی است} \end{array} \right\} \Rightarrow \sqrt{r-2a} > 0 \Rightarrow a < \frac{r}{2}, \omega \in \mathbb{N} \Rightarrow a = r \Rightarrow$

$\left. \begin{array}{l} x=0, y=r \Rightarrow r \cdot a - a \cdot a + c = r \\ x=1, y=1 \Rightarrow a - 1 \cdot a + c = 1 \end{array} \right\} \begin{array}{l} a = -\frac{1}{\lambda} \\ c = -\frac{1}{\lambda} \end{array}$  ← جابجایی  $\frac{1}{\lambda} = \text{فاصله}$

$S = \alpha + \beta = \frac{-(-a)}{a} = 1 \Rightarrow r\beta^2 + \alpha^2 - \beta = \frac{14}{r_0} \Rightarrow \beta^2 - \beta + (\alpha + \beta)^2 - 2\alpha\beta = \frac{14}{r_0}$

$= \beta(\beta-1) + 1 - 2\alpha\beta = \beta(\beta - (\alpha + \beta)) + 1 - 2\alpha\beta = -\alpha\beta + 1 = \frac{14}{r_0} \Rightarrow \alpha\beta = \frac{1}{r_0}$

$P = \frac{-b}{a} = \frac{1}{r_0} \Rightarrow a = -r_0 b \Rightarrow -r_0 \beta^2 + r_0 \beta - \beta = 0 \Rightarrow -r_0 \alpha + r_0 \alpha - 1 = 0$

تقابل  $\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{r_0}}{r_0} = \frac{1\sqrt{r_0}}{r_0} = \frac{r\sqrt{r_0}}{\omega}$  ← جابجایی

$a x^2 + b x + c = 0 \quad c = \frac{r}{r} \Rightarrow a x^2 + b x + \frac{r}{r}$

$-\frac{b}{r a} = \frac{-\omega + 1}{r} \Rightarrow b = r a \quad \text{و نیز} \quad -\frac{\Delta}{r a} = \frac{b^2 - 4ac}{r a} = \frac{1}{r}$

$\frac{(r a)^2 - 4(r a)c}{r a} = r a - c = \frac{1}{r} \Rightarrow \begin{cases} a = \frac{1}{r} \\ b = r \end{cases} \quad \frac{1}{r} + r \alpha \rightarrow \frac{r}{r} = \beta$

$\Rightarrow x^2 + r x + r - \beta = 0 \rightarrow x = \begin{cases} -\omega \\ 1 \end{cases} \rightarrow 1 + r + r\beta = 0 \Rightarrow \beta = r$  ✓

$x^2 + 9x + a = 0 \Rightarrow x = \begin{cases} \frac{-9 - \sqrt{81 - 4a}}{2} = -\frac{9}{2} - \sqrt{9 - a} = \alpha \\ \frac{-9 + \sqrt{81 - 4a}}{2} = -\frac{9}{2} + \sqrt{9 - a} = \beta \end{cases} \quad \alpha < \beta$  چون

$r\beta^2 + r\alpha^2 = (r \cdot 9 - r a - 12\sqrt{9-a}) + \omega^2 - r a + 12\sqrt{9-a} = 9 \Rightarrow -a + 4\sqrt{9-a} = 12\sqrt{9-a}$

$a - \omega a + 4\sqrt{9-a} = 12\sqrt{9-a} \Rightarrow a = 1$  ✓ ← جابجایی

$\frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = \frac{\sqrt{\alpha} + \sqrt{\beta}}{\sqrt{\alpha\beta}} = \omega \xrightarrow{\text{مربع}} \frac{\alpha + \beta + 2\sqrt{\alpha\beta}}{\alpha\beta} = \omega^2 \Rightarrow \frac{m+1}{r_0} + \frac{2\sqrt{\frac{1}{r_0}}}{\frac{1}{r_0}} = \omega^2$

$\Rightarrow \frac{m+1}{r_0} + \frac{2\sqrt{r_0}}{r_0} = \frac{r_0 \omega}{r_0} \quad (m = -1) \Rightarrow -\alpha^2 + r\alpha + r = 0$

$P = \frac{c}{a} = \frac{-r}{1} = -r$  ← جابجایی