

مهم دستر ۳

تکلیف ۲

سایجاد دسی

الف)

$$y = 2x^2 - 8x + 1$$

(۱)

$$\text{ext} \left\{ \begin{array}{l} \frac{-b}{2a} \Rightarrow \frac{8}{4} = 2 \\ \frac{-\Delta}{4a} \Rightarrow \frac{8ac - b^2}{4a} \Rightarrow \frac{16 - 64}{4} = -12 \end{array} \right.$$

$$\text{ext} \left\{ \begin{array}{l} 1 \\ -1 \end{array} \right.$$

ب)

$$y = -2x^2 + 4x - 5$$

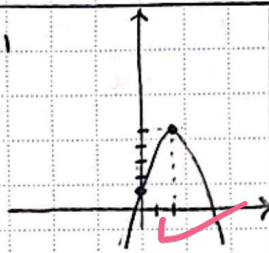
$$\text{ext} \left\{ \begin{array}{l} \frac{-b}{2a} \Rightarrow \frac{-4}{-4} = 1 \\ \frac{-\Delta}{4a} \Rightarrow \frac{8ac - b^2}{4a} \Rightarrow \frac{20 - 16}{-4} = -1 \end{array} \right.$$

$$\text{ext} \left\{ \begin{array}{l} 1 \\ -1 \end{array} \right.$$

ب) $y = -x^2 + 8x + 1$

$a < 0 \rightarrow \text{max}$

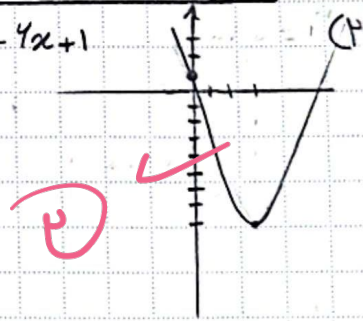
$$\text{ext} \left\{ \begin{array}{l} 8 \\ 17 \end{array} \right.$$



الف) $y = x^2 - 4x + 1$

$a > 0 \rightarrow \text{min}$

$$\text{ext} \left\{ \begin{array}{l} 2 \\ -1 \end{array} \right.$$



$$\epsilon x^2 + kx^2 - 9x - 2 = 0$$

(۲)

$$\alpha + \beta + \theta = \frac{-k}{\epsilon} \rightarrow \alpha + \beta = 1 \rightarrow \theta = \frac{-k}{\epsilon} - 1$$

$$\alpha\beta + \beta\theta + \alpha\theta = \frac{9}{\epsilon} \rightarrow -2 + \alpha\theta + \beta\theta = \frac{9}{\epsilon} \rightarrow \alpha\theta + \beta\theta = \frac{11}{\epsilon} \rightarrow \theta(\alpha + \beta) = \frac{11}{\epsilon}$$

$$\alpha\beta\theta = \frac{1}{\epsilon}$$

$$\rightarrow \theta = \frac{11}{\epsilon}$$

1,0

$$\rightarrow \theta = \frac{-k}{\epsilon} - 1 = \frac{11}{\epsilon} \rightarrow \frac{-k}{\epsilon} = \frac{12}{\epsilon} \rightarrow k = -12$$

α, β با هم
 $x^2 - 2mx + m = 0$ (ع)

$\Delta = 4m$

$p = m$

$|\sqrt{\alpha} - \sqrt{\beta}| = 1 \rightarrow \alpha + \beta - 2\sqrt{\alpha\beta} = 1$

$\rightarrow 2m - 2\sqrt{m} = 1 \xrightarrow{\sqrt{m}=t} 2t^2 - 2t - 1 = 0$ ریشه ها را
دو تا به دست
آورد $t \rightarrow \begin{cases} \frac{1}{2} \\ -\frac{1}{2} \end{cases}$

1/8

$2x^2 - mx - m = 0$

$p = \frac{-m}{2} \rightarrow \begin{cases} -\frac{1}{2} \\ -\frac{1}{2\sqrt{2}} \end{cases}$

\rightarrow ریشه ها = $-\frac{1}{2}, -\frac{1}{2\sqrt{2}}$

$y = 2x^2 - (m+2)x + m$ (د)

نقطه
 نایب $\rightarrow x_1, x_2$

نقطه
 نایب $\rightarrow x=0 \rightarrow y=m$

\rightarrow نقطه
 نایب $\rightarrow (x_1, 0), (x_2, 0), (0, m)$

$(\cos) \Delta = \frac{1}{2} |x_1(y_2 - y_1) + x_2(y_1 - y_2) + x_3(y_2 - y_1)|$

$\rightarrow \Delta = \frac{1}{2} |x_1(0 - m) + x_2(m - 0) + 0(0 - 0)| = \frac{1}{2} |-mx_1 + mx_2|$ *

$\Delta = \frac{3}{2}$

با استفاده از این معادله $2x^2 - \frac{m+2}{2}x + \frac{m}{2} = 0 \rightarrow x_2 - x_1 = \sqrt{(x_1 + x_2)^2 - 4x_1x_2}$

(مث) $\Delta = \frac{m+2}{2} \rightarrow x_2 - x_1 = \sqrt{(x_1 + x_2)^2 - 4x_1x_2} = \sqrt{\left(\frac{m+2}{2}\right)^2 - \frac{2m}{2}} =$

$\rightarrow \sqrt{\frac{(m+2)^2}{4} - 2m} = \sqrt{\frac{m^2 + 4m + 4 - 8m}{4}} = \sqrt{\frac{m^2 - 4m + 4}{4}} = \sqrt{\frac{(m-2)^2}{4}} =$

$\rightarrow \frac{|m-2|}{2}$

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اگر m باشد معادله درجه 2 در x است.

$\Delta = \frac{3}{2} \rightarrow |m(x_2 - x_1)| = \frac{3}{2} \rightarrow \left| m \cdot \frac{|m-2|}{2} \right| = \frac{3}{2} \rightarrow |m(m-2)| = 3 \rightarrow m(m-2) = \pm 3$

$\rightarrow m^2 - 2m - 3 = 0 \rightarrow m \rightarrow \begin{cases} 3 \\ -1 \end{cases}$

(ادامه صفحه بعد)

$$y = x^2 - mx + 1$$

(۵) اینه

$$\rightarrow \frac{-b}{2a} = \frac{m}{2} = x_s$$

$$\rightarrow x_s \begin{cases} \frac{3}{2} \\ -\frac{1}{2} \end{cases}$$



$$\boxed{-\frac{1}{2} \text{ و } \frac{3}{2}}$$

$$y = ax^2 + vx + a$$

(۶)

$$y_{\min} = \frac{-\Delta}{2a} = \frac{\Delta c - b^2}{2a} = \frac{\Delta a^2 - 9}{2a} = \frac{v}{1} \rightarrow 32a^2 - v^2 = 2\Delta a$$

$$\rightarrow 32a^2 - 2\Delta a - v^2 = 0 \rightarrow \Delta a^2 - v a - 1\Delta = 0$$

1, 18

$$\text{ریشه ها} \rightarrow a = \frac{v \pm \sqrt{(-v)^2 - 4(\Delta)(-1\Delta)}}{2\Delta} = \frac{v \pm \sqrt{v^2 + 4\Delta^2}}{2\Delta} = \frac{v \pm 2\Delta}{2\Delta}$$

$$\rightarrow a \begin{cases} -\frac{1}{\Delta} \\ \frac{1}{2} \end{cases}$$

$$\rightarrow a = 2 \text{ و } a = -\frac{9}{\Delta}$$

مقدار 2

با قیمت پارت 2 و در حالی که قیمت 2 است (۵)

$$x^2 - (a+1)x + a = 0$$

(۷)

$$\text{با } x_1 = 2n-1, x_2 = 2n+1, n \in \mathbb{N} \rightarrow x_1 + x_2 = 2n-1 + 2n+1 = 4n$$

$$x_1 x_2 = (2n-1)(2n+1) = 4n^2 - 1$$

$$\rightarrow x_1 + x_2 = a+1 = 4n \rightarrow a = 4n-1$$

$$x_1 x_2 = a \rightarrow a = 4n^2 - 1$$

$$\rightarrow 4n^2 - 1 = 4n - 1 \rightarrow 4n^2 - 4n = 0 \rightarrow 4n(n-1) = 0$$

$$\rightarrow n \begin{cases} 0 \\ 1 \end{cases} \rightarrow \text{طبیعی اند} \rightarrow x_1 = 1, x_2 = 3$$

$$a = 4n-1 = (4 \times 1) - 1 = 3$$

$$x^2 - (3a+1)x + b = 0 \rightarrow x^2 - 10x + b = 0$$

$$\text{با } z_1 = 2m, z_2 = 2m+2, m \in \mathbb{N} \rightarrow z_1 + z_2 = 4m+2$$

$$z_1 z_2 = 2m(m+1)$$

۲

$$\rightarrow z_1 + z_2 = 3a+1 \rightarrow 4m+2 = (3 \times 3) + 1 = 10 \rightarrow 4m+2 = 10 \rightarrow m = 2$$

$$\rightarrow z_1 = 4, z_2 = 6$$

$$\rightarrow b = z_1 z_2 = 24$$

$$\boxed{z_1 z_2 - x_1 x_2 = 24 - 3 = 21}$$

$$y_s = -ax^r + ax + r \quad (A)$$

$$x_s = \frac{-b}{2a} = \frac{-a}{-2a} = \frac{1}{2}$$

$$y_s = \frac{\epsilon ac - b^2}{\epsilon a} = \frac{-1a - a^2}{-\epsilon a} = \frac{a}{\epsilon} + r$$

$$b - a = (-4) - (-12)$$

$$b - a = 4$$

$$y_s = 2bx^r - bx - 1$$

$$y_s = \frac{a}{\epsilon} + r \quad x_s = \frac{1}{2}$$

$$\rightarrow \frac{a}{\epsilon} + r = 2b\left(\frac{1}{2}\right)^r - b\left(\frac{1}{2}\right) - 1 \rightarrow \frac{a}{\epsilon} + r = \frac{b}{2} - \frac{b}{2} - 1 \rightarrow \frac{a}{\epsilon} + r = -1 \rightarrow \underline{a = -12}$$

$$\rightarrow x_s = \frac{-b}{2a} = \frac{b}{\epsilon b} = \frac{1}{\epsilon}$$

$$y_s = \frac{-b}{1} - 1$$

$$\frac{-b}{1} - 1 = \frac{12}{\epsilon} - 12 + r \rightarrow \frac{-b}{1} - 1 = \frac{12}{\epsilon} - 12 \rightarrow \frac{-b}{1} = \frac{12}{\epsilon} \rightarrow -b = 4 \rightarrow \underline{b = -4}$$

$$y = 2\alpha x^r + \epsilon x + \beta \quad (A)$$

$$\alpha < \beta$$

$$x_s = \frac{-b}{2a} = \frac{-\epsilon}{2\alpha} = \frac{-r}{2\alpha}$$

$$y_s = 2\alpha \left(\frac{-r}{2\alpha}\right)^r + \epsilon \left(\frac{-r}{2\alpha}\right) + \beta = \frac{\epsilon}{2\alpha} - \frac{1}{2\alpha} + \beta$$

$$x_r = \beta \quad x_1 = \alpha \quad \text{دسته ها}$$

$$x_1 + x_r = \alpha + \beta = -\frac{b}{a} = \frac{-\epsilon}{2\alpha}$$

$$x_1 x_r = \alpha \beta = \frac{c}{a} = \frac{\beta}{2\alpha}$$

$\alpha < 0, \beta < 0$
 راست در ربع ۳
 $\alpha > 0, \beta > 0$
 راست در ربع ۱

$\alpha > 0 \rightarrow \min, x_s \text{ کمترین}, y_s \text{ بیشترین}$
 $\alpha < 0 \rightarrow \max, x_s \text{ بیشترین}, y_s \text{ کمترین}$

$\rightarrow x_s = \frac{-r}{2\alpha}$
 $\alpha > 0 \rightarrow x_s < 0$
 $\alpha < 0 \rightarrow x_s > 0$

$\beta < \alpha < 0 \rightarrow \alpha < 0 \rightarrow \frac{\epsilon}{2\alpha} < 0$
 $\rightarrow y_s < 0$

$$x^2 - (a^r + b^r - 1)x + (a + b - 1) = 0 \quad (1)$$

$$x_1 + x_2 = a^r + b^r - 1$$

$$x_1 x_2 = a + b - 1$$

$$a + b = Q \rightarrow x_1 x_2 = Q - 1, \quad a^r + b^r = Q^r - r ab \rightarrow x_1 + x_2 = Q^r - r ab - 1$$

$$\rightarrow x_1 = 1, \quad x_2 = ?$$

$$x_1 x_2 = Q - 1 \rightarrow x_2 = Q - 1 \rightarrow x_1 + x_2 = 1 + (Q - 1) = Q$$

$$\rightarrow x_1 + x_2 = a^r + b^r - 1 = Q^r - r ab - 1$$

$$\rightarrow Q = Q^r - r ab - 1 \rightarrow Q^r - r ab - Q - 1 = 0 \rightarrow r ab = Q^r - Q - 1$$

$$\rightarrow ab = \frac{Q^r - Q - 1}{r}$$

$$Q^r - Q - 1 = 9 - 9 - 1 = -1 \rightarrow r ab = -1 \rightarrow ab = 9 \rightarrow a + b = 4$$

$$x^2 - (a^r + b^r - 1)x + a + b - 1 = x^2 - (9 + 9 - 1)x + 4 - 1 = x^2 - 17x + 3$$

جواب ✓ 1, 3 و 3

$$a + b = 4$$

جواب

$$\alpha + \beta = 1$$

$$\alpha\beta = -r \rightarrow x^r - 5x + p \rightarrow x^r - x - r \sim (x-r)(x+1) = 0$$

۲

$$x=r \rightarrow f(r)^r + k - n - r = 0 \rightarrow \boxed{k = -r}$$

$$\sqrt{\alpha} - \sqrt{\beta} = 1 \xrightarrow{\text{توان ۲}} \alpha + \beta - 2\sqrt{\alpha\beta} = 1 \rightarrow r_m - 2\sqrt{m} = 1 \quad (r_m = t)$$

۲

$$r_m^r - 2t - 1 = 0 \rightarrow t = 1 \quad \sqrt{m} \rightarrow m = 1$$

$$\hookrightarrow t = \frac{1}{r}$$

$$r_m^r - m - 1 = 0 \rightarrow r_m^r - x - 1 = 0 \rightarrow \frac{c}{a} = \frac{-1}{r}$$

$$\frac{c}{a} = \frac{b}{ra} = \alpha\beta \rightarrow \alpha^r = \frac{1}{r\alpha} \rightarrow \alpha = \pm \frac{1}{a}$$

۹

$$-\frac{b}{a} = \frac{-r}{ra} = \alpha + \beta \rightarrow \alpha = \frac{1}{a} \rightarrow \beta = -1$$

$$\hookrightarrow \alpha = -\frac{1}{a} \rightarrow \beta = 1 \quad \checkmark (\beta > \alpha)$$

$$y = -2x^r + kx + 1 \rightarrow \begin{cases} x_B = \frac{r}{1} \text{ مثبت} \\ y_B = \frac{-\Delta}{4a} = \frac{-(14+20)}{-2} = \frac{9}{a} \text{ مثبت} \end{cases}$$

* راس سهمی در نیمه اول است

$$a^r + b^r - 12 = a + b \rightarrow s^r - 2p - 12 = s$$

۱۰

$$a + b - 1 = ab \rightarrow s - 1 = p \rightarrow s^r - 2s + 2 - 12 - s = 0$$

$$s^r - 3s - 10 = 0 \rightarrow (s - 5)(s + 2) = 0$$

$$\downarrow$$
$$\checkmark s = 5$$

$$\downarrow$$

$$s = -2x$$

ا، ب اعداد طبیعی هستند!