

الف)  $y = x^2 - 4x + 7$

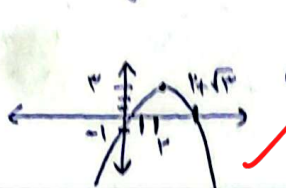
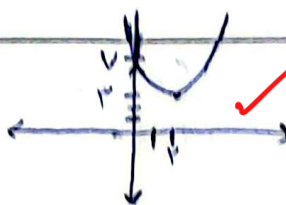
$x_{min} = -\frac{b}{2a} = -\frac{-4}{2} = 2$

$y_{min} = 4 - 16 + 7 = -5$

ب)  $y = -x^2 + 4x - 1$

$x_{max} = -\frac{b}{2a} = -\frac{4}{-2} = 2$

$y_{max} = -4 + 16 - 1 = 11$



$\Delta = (-4)^2 - 4(1)(7) = 16 - 28 = -12 < 0$   
 $\Delta = (-4)^2 - 4(-1)(-1) = 16 - 4 = 12 > 0$

$2x^2 + (m+1)x + \frac{1}{2}m + 2 = 0$

$(m-5)(m+2)$

الف)  $\Delta > 0 \rightarrow m^2 + 1 + 2m - 4m - 14 > 0 \rightarrow m^2 - 2m - 13 > 0 \rightarrow m = (-\infty, -3) \cup (5, \infty)$

ب)  $\Delta = 0 \rightarrow m^2 - 2m - 13 = 0 \rightarrow m = 5, -3$

ج)  $\Delta < 0 \rightarrow m^2 - 2m - 13 < 0 \rightarrow m = (-3, 5)$

د)  $\Delta \geq 0 \rightarrow m^2 - 2m - 13 \geq 0 \rightarrow m = (-\infty, -3] \cup [5, \infty)$

$y = (m-2)x^2 - 2(m+1)x + 10$

الف)  $\frac{c}{a} < 0 \rightarrow \frac{10}{m-2} < 0 \rightarrow m-2 < 0 \rightarrow m = (-\infty, 2)$

ب)  $\frac{b}{2a} = \frac{1}{2} \rightarrow \frac{-(m+1)}{m-2} = \frac{1}{2} \rightarrow -2(m+1) = m-2 \rightarrow -2m-2 = m-2 \rightarrow -3m = 0 \rightarrow m = 0$

$\frac{2x^2}{3} - (2\sin\alpha)x + \frac{4}{3} = 0 \rightarrow \Delta \geq 0 \rightarrow 4\sin^2\alpha - 4 \geq 0$

$\rightarrow \sin^2\alpha \geq 1 \rightarrow \sin\alpha = \pm 1$

$\rightarrow \text{if } \sin\alpha = 1 \rightarrow \frac{2}{3}x^2 - 2x + \frac{4}{3} = 0 \rightarrow x = \frac{2 \pm \sqrt{4 - \frac{16}{3}}}{\frac{4}{3}} = \frac{3}{2}$

$\rightarrow \text{if } \sin\alpha = -1 \rightarrow \frac{2}{3}x^2 + 2x + \frac{4}{3} = 0 \rightarrow x = \frac{-2 \pm \sqrt{4 - \frac{16}{3}}}{\frac{4}{3}} = -\frac{3}{2}$

$y = (m-2)x^2 - 2(m+1)x + 10$

الف)  $S = -\frac{b}{a} < 0 \rightarrow \frac{b}{a} > 0 \rightarrow \frac{-2(m+1)}{m-2} > 0 \rightarrow m = (-1, 2)$   
 $\rightarrow P > 0 = \frac{c}{a} > 0 \rightarrow \frac{10}{m-2} > 0 \rightarrow m > 2$

ب)  $P = -\frac{b}{a} < 0 \rightarrow \frac{b}{a} > 0 \rightarrow m = (-1, 2)$   $P = \frac{c}{a} < 0 \rightarrow m < 2$

$\Delta > 0 \rightarrow 4m^2 + 4 + 16m - 40m + 16 > 0 \rightarrow 4m^2 - 32m + 16 > 0$

$\rightarrow m^2 - 8m + 4 > 0 \rightarrow m = (-1, 2)$

$$y(n-1)(n+\frac{1}{p}) \quad y(n-\frac{\Delta}{r})(n+1)$$

$$y = \frac{(2n^2-3n-1)(2n^2-3n-\Delta)}{1-n^2}$$

$$\rightarrow y = \frac{4(n^2-1)(n+1)(n+\frac{1}{p})(n-\frac{\Delta}{r})}{(1-n)(1+n)} = -4(n+\frac{1}{p})(n-\frac{\Delta}{r})$$

$$= -(2n+1)(2n-\Delta) = -4n^2 + 14n + \Delta \rightarrow y_{max} = -\frac{\Delta}{4a}$$

$$= +\frac{149+120}{4 \times 4} = \frac{269}{16} \checkmark$$

$$m^2 - (m+2)n - 2 = 0$$

$$yS = \Delta p + V$$

$$2n^2 - 4n - 2 = 0$$

$$\rightarrow 2 \times \frac{m+2}{m} = \Delta \times \frac{2}{m} + V \rightarrow \frac{2(m+2)}{m} = \frac{-10}{m} + V$$

$$\xrightarrow{xm} \frac{2(m+2)}{m+4} = -10 + Vm \rightarrow 2m = 14 \rightarrow m = 7 \quad \begin{matrix} S = \frac{r}{p} \\ p = -\frac{1}{r} \end{matrix}$$

$$\rightarrow \alpha^2 + \beta^2 = S^2 - 2P = \frac{9}{4} + 1 = \frac{13}{4} \checkmark$$

$$m^2 - \Delta n + 2 = 0$$

$$\alpha\beta = 2 \quad \alpha + \beta = \Delta$$

$$\frac{f\alpha + \beta^2}{\Delta\beta^2} \xrightarrow{\times \beta} \frac{f\alpha\beta + \beta^3}{\Delta\beta^2}$$

$$\rightarrow \frac{1 + \beta^3}{\Delta\beta^2} = \frac{(\beta^2+2)(\beta^2+2-2\beta^2)}{\Delta\beta^2} = \frac{\beta^2+2-2\beta^2}{\beta^2}$$

$$= \beta^2 - 2 + \frac{2}{\beta^2} \rightarrow \alpha\beta = 2 \quad \alpha^2 = \frac{f}{\beta^2} \rightarrow \beta^2 - 2 + \alpha^2$$

$$= S^2 - 2P - 2 = 25 - 4 - 2 = 19 \checkmark$$

$$y_1 = an^2 + bn + c \quad an^2 + (b-2)n + c - 10 = 0 \rightarrow \text{ریشه ها } -2 \text{ و } 2$$

$$y_2 = 2n + 10$$

خود سهمی کوربندی ها رو در ۴ نقطه میانه نه معادله تقاطع خط و سهمی!

$$\rightarrow \text{با عرض تقاطع می کنه} \rightarrow c - 10 = 4 \rightarrow c = 14 \rightarrow an^2 + (b-2)n + 4$$

$$\rightarrow = n(n-2)(n+3) \rightarrow n \times (-4) = 4 \rightarrow n = -\frac{2}{4}$$

$$\rightarrow \text{عبارت} = -\frac{1}{4}n^2 - \frac{1}{4}n + 4 = 0 \quad \begin{matrix} a = -\frac{1}{4} \\ b = -\frac{1}{4} + 2 = \frac{7}{4} \end{matrix}$$

$$\text{سه اول} = -\frac{1}{4}n^2 + \frac{7}{4}n + 14 \rightarrow \text{مختصات} = -\frac{b}{2a} = -\frac{\frac{7}{4}}{-\frac{1}{2}} = \frac{7}{2} = 3.5$$

$$y = 2n^2 + (m+1)n + m+9 \quad y = 2n^2 + (m)n + m+9 \rightarrow \Delta = 0$$

$$y = n$$

$$\rightarrow \Delta = m^2 - 1m - 41 = 0 \rightarrow (m-12)(m+4) = 0$$

$$\text{if } m = 12 \rightarrow n = -3 \quad \text{در ناحیه اول نیست}$$

$$\text{if } m = -4 \rightarrow n = 1 \quad \text{در ناحیه اول است} \checkmark$$

$$\begin{aligned} \underline{(1, 14)} &\rightarrow 1a + 1b + \overset{+}{c} = 14 \\ \underline{(-3, 4)} &\rightarrow 9a - 3b + \overset{+}{c} = 4 \end{aligned} \quad \left\{ \begin{array}{l} \text{حل} \\ \text{المعادن} \end{array} \right. \quad \begin{array}{l} a = 1 \\ b = 3 \end{array}$$

9

$$\underline{(0, 4)} \rightarrow c = 4$$

$$y = x^2 + 3x + 4 \rightarrow \text{المعادن} : x_{\text{ext}} = -\frac{3}{2}$$