

الف) $y = x^2 - 4x + 7$

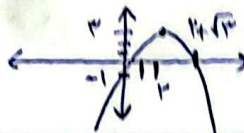
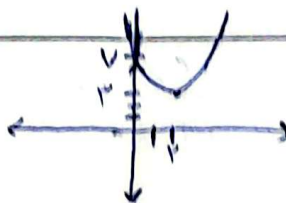
$x_{\min} = -\frac{b}{2a} = -\frac{-4}{2} = 2$

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

ب) $y = -x^2 + 4x - 1$

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

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



$(x, y) = \left(-\frac{-4 \pm \sqrt{16 - 4(-1)(-5)}}{-2}, -2 \pm \sqrt{11} \right)$

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

$(m-2)(m+2) \quad \frac{-2 \pm \sqrt{4}}{2}$

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

ب) $\Delta = 0 \rightarrow m^2 - 2m - 13 = 0 \rightarrow m = 2 \text{ و } -3$

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

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

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

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

ب) $\neq \frac{b}{2a} = \neq 2 \rightarrow \frac{-(2m+2)}{2m-4} = \neq 2 \rightarrow -2m+1 = 2m+2$
 $\rightarrow 4m = -1 \rightarrow m = -\frac{1}{4}$

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

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

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

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

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

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

$\rightarrow P > 0 = \frac{c}{a} > 0 \rightarrow \frac{10}{m-2} > 0 \rightarrow m > 2$

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

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

$\rightarrow m^2 - 8m + 4 > 0 \rightarrow \Delta \text{ منفی} \rightarrow \text{همیشه مثبت} \rightarrow m = (-1, 2)$

$$f(n-1)(n+\frac{1}{p}) f(n-\frac{\Delta}{f})(n+1)$$

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

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

$$= -(fn+1)(fn-\Delta) = -fn^2 + 1fn + \Delta \rightarrow y_{max} = -\frac{\Delta}{fa}$$

$$= +\frac{149+120}{f^2 f} = \frac{269}{f^2}$$

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

$$fS = \Delta p + V$$

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

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

$$\xrightarrow{xm} \frac{f(m+2)}{m+4} = -10 + Vm \rightarrow fm = 14 \rightarrow m = f \begin{cases} S = \frac{f}{f} \\ p = -\frac{1}{f} \end{cases}$$

$$\rightarrow \alpha^2 + \beta^2 = S^2 - 2P = \frac{9}{f} + 1 = \frac{14}{f}$$

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

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

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

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

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

$$= S^2 - 2P - 2 = 2\Delta - f - 2 = 19$$

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

$$y_2 = 2n + 10$$

$$\rightarrow \text{مجموعه ریشه ها} \rightarrow c - 10 = f \rightarrow c = 1f \rightarrow an^2 + (b-2)n + f$$

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

$$\rightarrow \text{مجموعه} = -\frac{f}{4}n^2 - \frac{f}{4}n + f = 0 \leftarrow a = -\frac{f}{4}$$

$$\text{مجموعه اول} = -\frac{f}{4}n^2 + \frac{f}{4}n + 1f \rightarrow \text{مجموعه دوم} = -\frac{b}{4a} = -\frac{\frac{f}{4}}{-\frac{f}{4}} = 1$$

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

$$y = n$$

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

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

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