۲۰

(۱)

الف) $y=2x^2-4x+1$ — $a>0 \to Min$

$Min \begin{cases} -\frac{b}{2a}=-\frac{-4}{4}=+1 \\ -\frac{\Delta}{4a}=-1 \end{cases}$ $\quad Min \begin{cases} +1 \\ -1 \end{cases}$

(۲)

ب) $y=-2x^2+4x-5$ — $a<0 \to Max$

$Max \begin{cases} -\frac{b}{2a}=-\frac{4}{-4}=+\frac{4}{4} \\ -\frac{\Delta}{4a}=-\frac{9+16}{-8}=+\frac{49}{8} \end{cases}$

$-\frac{1}{2}\times\frac{9}{16}+\frac{9}{4}$

(۳)

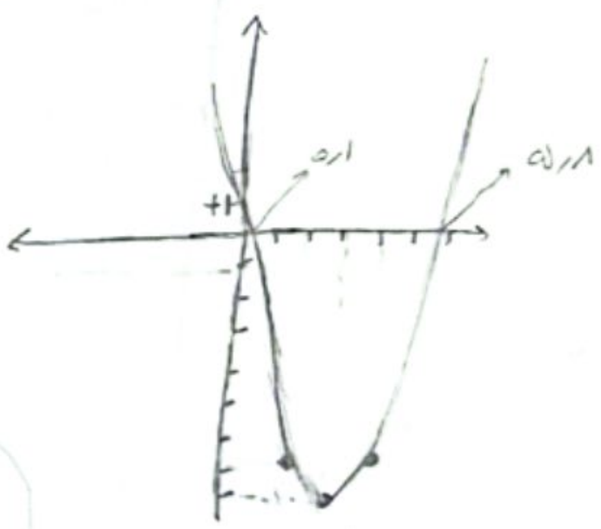
الف) $y=x^2-6x+1$

$\Delta=36-4=32$ — محور x ها را در کدام قطع می‌کند $\Rightarrow \frac{+6\pm\sqrt{32}}{2} \simeq \begin{cases} 5/8 \\ 0/1 \end{cases}$

$S \begin{cases} -\frac{-6}{2}=+3 \\ -8 \end{cases}$

۲	۳	۴
-۷	-۸	-۷

$a>0 \to Min$



(۵)

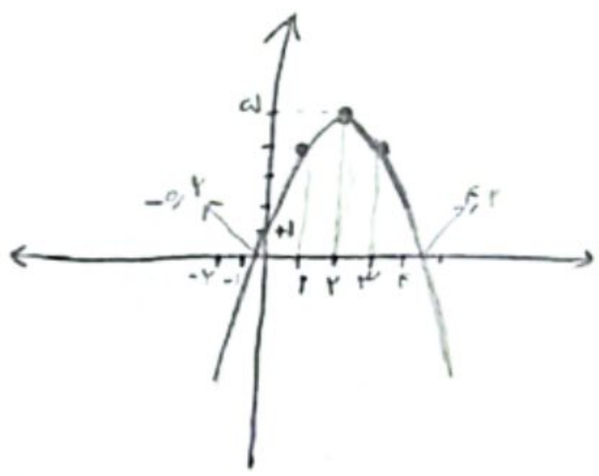
(۴)

ب) $y=-x^2+4x+1$

$\Delta=16+4=20$ — محور x ها را در کدام قطع می‌کند $\Rightarrow \frac{-4\pm\sqrt{20}}{-2} \simeq \begin{cases} -0/2 \\ 4/2 \end{cases}$

$S \begin{cases} -\frac{4}{-2}=+2 \\ 5 \end{cases}$

۱	۲	۳
۴	۵	۴



(۳)

$2x^3+kx^2-9x-2=0$

$\alpha+\beta=1$

$\alpha\beta=-2$

ریشه سوم $\to \theta$

$\alpha+\beta+\theta=-\frac{k}{2}$

$\alpha\beta\theta=\frac{2}{2}$ (-2 ↓ $-\frac{1}{2}$)

$-\frac{1}{2}=-\frac{1}{2}=-\frac{k}{2} \to k=-3$ ($+\frac{3}{2}$)

(۴)

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

$\alpha+\beta=2m$ $\quad x^2-Sx+P=0$

$\alpha\beta=m$

$|\sqrt{\alpha}-\sqrt{\beta}|=1 \to (\sqrt{\alpha}-\sqrt{\beta})^2=|\alpha+\beta-2\sqrt{\alpha\beta}|=1$

$t=\sqrt{m}$ $\quad 2m-2\sqrt{m}=1$

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

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

$\alpha\beta=\frac{c}{a}=\frac{-m}{2}=-\frac{1}{2}$

$2t^2-2t-1=0$

$t^2-2t-1=2$ (1×2)

$(t+1)(t-2)$ ($-\frac{1}{2}$ ، $\frac{2}{1}=2$) $\quad t=\sqrt{m}\geq 0$

$t=2$

$y=-ax^2+bx+c$

$x_{راس}=-\frac{b}{2a}$ $\Rightarrow$ $-\frac{b}{2a}=+\frac{1}{2}$ $\Rightarrow$ $-b=2a$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+c$ $\quad$ (با $\frac{a}{2}+c$)

$y=2ax^2-bx-1 \to 2a(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{a}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{2a}=\frac{b}{a}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{2}-1$

$\frac{b}{2}=-\frac{1}{2}$ $\quad$ $b=-1$

$b-a=-1-(-2)=1$

(1)

$y=-(-2)x^2+(-2)x+2=2x^2-2x+2$

$\frac{11}{12}-\frac{12}{12}+\frac{2}{12}=-\frac{1}{12}$

$\frac{a}{2}+b=-1$ $\quad$ $a=-2$

$y=-(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{9}{2})$

$y=2x^2-bx-1$ $\quad$ $y(\frac{1}{2})=b(\frac{1}{2})-1=-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(2)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(3)

$y=-(-12)x^2+(-12)x+2=12x^2-12x+2$

$\frac{11}{12}-\frac{12}{12}+\frac{2}{12}=-\frac{1}{12}$

$\frac{a}{2}+b=-1$ $\quad$ $\frac{a}{2}+12=-1$ $\quad$ $\frac{a}{2}=-13$ $\quad$ $a=-26$

$y=-(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{9}{2})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(4)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(5)

$y=-(-12)x^2+(-12)x+2=12x^2-12x+2$

$\frac{11}{12}-\frac{12}{12}+\frac{2}{12}=-\frac{1}{12}$

$\frac{a}{2}+b=-1$ $\quad$ $\frac{a}{2}+12=-1$ $\quad$ $\frac{a}{2}=-13$ $\quad$ $a=-26$

$y=-(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{9}{2})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(6)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(7)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(8)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(9)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(10)

$y=-ax^2+bx+2$

$x_{راس}=-\frac{b}{2a}=\frac{1}{2}$ $\quad$ $-\frac{b}{a}=1$

$y=-a(\frac{1}{2})^2+a\frac{1}{2}+2$ $\quad$ $(a=\frac{8}{3})$

$y=2x^2-bx-1 \to 2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-1$ $\quad$ $\frac{b}{2}-\frac{b}{2}-1=-1$

$x_{راس}=-\frac{-b}{4a}=\frac{b}{8}=\frac{1}{2}$ $\quad$ $y=2b(\frac{1}{2})^2-b(\frac{1}{2})-1=-\frac{b}{4}-1$

$-\frac{b}{4}-1=-\frac{1}{2}$ $\quad$ $b=-2$

$b-a=-2-(-12)=10$

(9)

$y = 2\alpha x^2 + 6x + \beta$

$\left(\alpha\beta = \frac{\beta}{2\alpha}\right) \Rightarrow 2\alpha x^2\beta = \beta$

$2\alpha x^2 = 1$

$\alpha^2 = \frac{1}{4} \quad \alpha = \pm\frac{1}{2}$

$\alpha = \frac{1}{2} \rightarrow \alpha+\beta = -\frac{6}{2\alpha} = -\frac{6}{2} = -3$

$\frac{1}{2} + \beta = -3 \quad \beta = -\frac{7}{2} \leftarrow \beta > \alpha$

$\alpha = -\frac{1}{2} \quad \alpha+\beta = -\frac{6}{2\alpha} = +\frac{6}{2} = 3$

$-\frac{1}{2} + \beta = 3 \quad \beta = 1 \leftarrow \beta > \alpha$

(۲)

$y = -\frac{1}{2}x^2 + 6x + 1$

$S \begin{cases} -\frac{b}{2a} = -\frac{6}{2(-\frac{1}{2})} = 6 \\ \frac{9}{2} \end{cases}$

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(10)

$x^2 - (a^2+b^2-14)x + (a+b-1) = 0$

(۲)

$a+b = a^2+b^2-14 \Rightarrow S = S^2 - 2P - 14 \Rightarrow S = S^2 - 2S + 2 - 14 \rightarrow S^2 - 3S - 10 = 0$

$(a+b)^2 = a^2+b^2+2ab$

$ab = a+b-1 \rightarrow P = S-1$

$(S-5)(S+2) = 0$

$S = 5$ ، -2α

a و b ~ اعداد طبیعی اند