۱) الف) $2x^2-4x+1$

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

ب) $-2x^2+3x-5$

$$\max \begin{cases} \frac{3}{4} \\ \frac{-31}{8} \end{cases}$$

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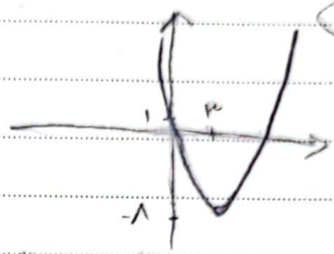
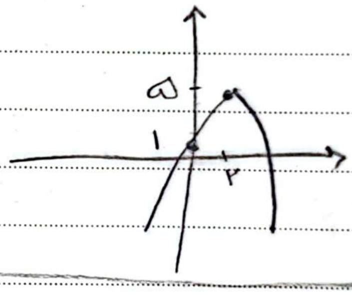
۲) الف) $y = x^2 - 6x + 1$



$\frac{-b}{2a} = 3$

$\frac{-\Delta}{4a} = -8$

ب) $y = -x^2 + 4x + 1$



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

$\frac{-\Delta}{4a} = 5$

---

۳) $4x^3 + kx^2 - 9x - 2 = 0$ $\alpha + \beta = 1$ $\alpha\beta = -2$

$\alpha + \beta + \theta = \frac{-k}{4} \Rightarrow 1 + \theta = -\frac{k}{4}$

$\alpha\beta\theta = \frac{2}{4} = \frac{1}{2} \Rightarrow -2\theta = \frac{1}{2} \Rightarrow \theta = \frac{-1}{4}$

$\Rightarrow \frac{3}{4} = \frac{-k}{4} \Rightarrow \boxed{k = -3}$

کیمیا ملا (وزی)

(4)

$x^2 - 3mx + m = 0$

$$\sqrt{\frac{3m+\sqrt{9m^2-4m}}{2}} - \sqrt{\frac{3m-\sqrt{9m^2-4m}}{2}} = 1$$

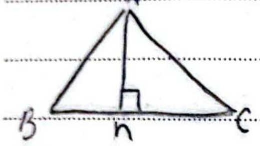
$$\frac{3m+\sqrt{9m^2-4m}+3m-\sqrt{9m^2-4m}}{2} - 2\left(\frac{9m^2-9m^2+4m}{4}\right) = 1$$

$3m - 2m = m = 1$ / $2x^2 - mx - m = 0 \to P = \frac{-m}{2}$

$P = \frac{-1}{2}$

---

(5)



$Ah = C$, $BC = \frac{\sqrt{\Delta}}{|a|}$

$$\frac{m \times \frac{\sqrt{m^2+4+4m-8m}}{2}}{2} = \frac{m \times \sqrt{(m-2)^2}}{4} = \frac{m \times |m-2|}{4} = \frac{3}{4}$$

$m|m-2| = 3$

- $m < 0 \Rightarrow \varnothing$
- $0 < m < 2 \Rightarrow -m^2 + 2m - 3 = 0 \to m = \{\}$
- $m > 2 \Rightarrow m^2 - 2m - 3 = 0 \to m = -1$, $m = 3$

$\frac{-b}{2a} = \frac{m}{2} \to \frac{-1}{2}$, $\frac{3}{2}$

---

(6)

$\min \Rightarrow a > 0$ $\qquad \frac{-b}{2a} = \frac{-3}{2a}$

$$a\left(\frac{-3}{2a}\right)^2 + \left(3 \times \frac{-3}{2a}\right) + a = \frac{7}{8} \Rightarrow \frac{9}{4a} - \frac{9}{2a} + a = \frac{7}{8}$$

$a - \frac{9}{4a} = \frac{7}{8} \to 8a^2 - 18 = 7a \Rightarrow 8a^2 - 7a - 18 = 0$

$49 + 576 = 625$, 25

$\frac{7 \pm 25}{16} = 2$, ~~$-\frac{9}{8}$~~

$a = 2$ یک مقدار

(۷) $(x-a)(x-1)=0 \to a=1$

۸ $x^2+10x+b=0$

$\alpha+\beta=\alpha+\alpha+2=10 \to \alpha=4,\ \beta=6 \to b=24$

۹ $b-a=24-10=21$

---

(۱) $\frac{-b}{2a}=\frac{-a}{-2a}=\frac{1}{2}$

$\frac{-\Delta}{4a}=\frac{-(a^2+8a)}{-4a}=\frac{a+8}{4}$

(۸) ۱۰ $\frac{b}{2}-\frac{b}{2}-1=\frac{a+8}{4}$

۱۱ $a+8=-4 \to a=-12$

(۲) $\frac{-b}{2a}=\frac{b}{4b}=\frac{1}{4}$

$\frac{-\Delta}{4a}=\frac{-b^2-8b}{8b}=\frac{-b-8}{8}$

۱۲ $\frac{12}{-a}+\frac{-12}{4}+2=\frac{-b}{8}-1$

$\frac{3}{4}-3+2=\frac{-b}{8}$

۱۳ $\frac{b}{8}=\frac{-3}{4} \to b=-6$

$b-a=-6-(-12)=6$

۱۴

۱۵

۱۶

$y = 2\alpha x^2 + 4x + \beta$ (a)

$\alpha + \beta = \frac{-4}{2\alpha}$

$\alpha\beta = \frac{\beta}{2\alpha} \Rightarrow 2\alpha^2 = 1 \rightarrow \alpha^2 = \frac{1}{2} \Rightarrow \alpha = \pm\frac{1}{\sqrt{2}}$ ($\beta \neq 0$)

$\alpha = \frac{1}{\sqrt{2}} \rightarrow \beta = \frac{-4}{\sqrt{2}} - \frac{1}{\sqrt{2}} = -1 \rightarrow \beta < \alpha$ ✗

$\alpha = -\frac{1}{\sqrt{2}} \rightarrow \beta = \frac{-4}{-\sqrt{2}} + \frac{1}{\sqrt{2}} = 1 \rightarrow \beta > \alpha$ ✓

$y = -\sqrt{2}x^2 + 4x + 1$

$\frac{-b}{2a} = \frac{-4}{-10} = \frac{2}{5} > 0$

$\frac{-\Delta}{4a} = \frac{-(16+8)}{-8} = \frac{24}{8} = 3 > 0$

→ نامعه اول

(b)

$a + b = a^2 + b^2 - 12$

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

$a^2 + b^2 - 12 = ab + 1 \rightarrow a^2 + b^2 = ab + 13 \rightarrow (a+b)^2 - 2ab = ab + 13$

$a+b-1$

$(a+b)^2 - 3ab - 13 = 0 \rightarrow (a+b)^2 - 3(a+b) - 10 = 0$

$(S-5)(S+2) = 0 \Rightarrow S = 5$ ✓

$\Rightarrow S = -2$ ✗ → طبیعی

$a + b = 5$