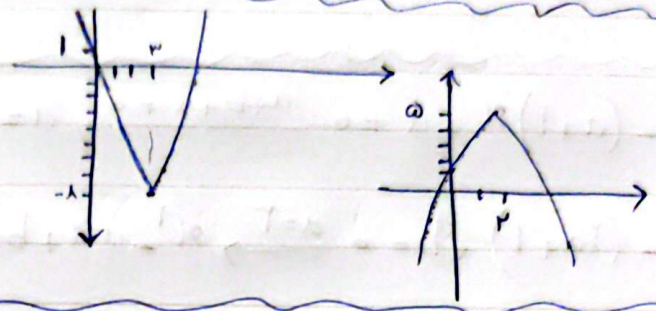
Subject: A دهم تجربی Date: پارسا رحالی

۱- الف) $y = 2x^2 - 4x + 1 \longrightarrow \min \begin{cases} -\frac{b}{2a} = \frac{4}{4} = 1 \\ -1 \end{cases} \searrow 2(1)^2 - 4(1) + 1 = -1$

ب) $y = -2x^2 + 3x - 5 \longrightarrow \max \begin{cases} -\frac{b}{2a} = \frac{3}{-4} \\ \frac{-\Delta}{4a} = \frac{-31}{-8} \end{cases}$

۲- الف) $y = x^2 - 6x + 1 \longrightarrow \min \begin{cases} 3 \\ -8 \end{cases}$

ب) $y = -x^2 + 4x + 1 \longrightarrow \max \begin{cases} 2 \\ 5 \end{cases}$



۳- $4x^3 + kx^2 - 9x - 2 = 0 \longrightarrow 4(x-a)(x-\beta)^2 = 4(x-a)(x^2 - 2\beta + \beta^2)$

$\Rightarrow 4x^3 - 8\beta x^2 + 4\beta^2 x - 4ax^2 + 8a\beta x - 4a\beta^2$

$= 4x^3 - (4a + 8\beta)x^2 + (4\beta^2 + 8a\beta)x - 4a\beta^2$

$\hookrightarrow -4a\beta^2 = -2 \xrightarrow{a\beta = -2} 8\beta = -2 \Rightarrow \beta = -\frac{1}{4}$

$a + \beta = 1 \xrightarrow{\beta = -\frac{1}{4}} a - \frac{1}{4} = 1 \Rightarrow a = \frac{5}{4}$

$k = -4a - 8\beta = -4 \times \frac{5}{4} - 8 \times \frac{-1}{4} = -5 + 2 = -3$

۴- $x^2 - 2mx + m = 0 \longrightarrow \sqrt{a} - \sqrt{\beta} = 1 \Rightarrow \underbrace{a+\beta}_{2m} - 2\sqrt{a\beta} = 1$

$\Rightarrow 2m - 2\sqrt{m} = 1 \longrightarrow 2m - \sqrt{2}m - 1 = 0 \Rightarrow \sqrt{\ } = \frac{2 \pm \sqrt{16}}{4}$

1 ✓

$-\frac{1}{2}$ ×

۵- $2x^2 - (m+2)x + m \longrightarrow \Delta = m^2 + 2m + 4 - 8m = m^2 - 6m + 4 = (m-2)^2$

$\frac{3}{4} = \frac{1}{2} \times \frac{\sqrt{\Delta}}{|a|} \times m = \frac{1}{2} \times \frac{|m-2|}{2} \times m \longrightarrow \frac{m^2 - 2m}{4} = \frac{3}{4} \Rightarrow m^2 - 2m - 3 = 0$ ✓

$m^2 - 2m - 3 = 0 \longrightarrow (m-3)(m+1) = 0$

$3 \leftarrow$ $-1 \leftarrow$

$\searrow \frac{-m^2 + 2m}{4} = \frac{3}{4} \Rightarrow m^2 - 2m + 3 = 0$ ×

$\Delta < 0$

$y \nearrow x^2 + x + 1 \longrightarrow \frac{-b}{2a} = \frac{-1}{2}$

$y \searrow x^2 - 2x + 1 \longrightarrow \frac{-b}{2a} = \frac{2}{2}$

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۶- $y = ax^2 + 3x + a \longrightarrow \frac{-\Delta}{4a} = \frac{7}{8} \Rightarrow -\frac{9-4a^2}{a} = \frac{7}{2}$

$\Rightarrow -7a = 18 - 8a^2 \Rightarrow 8a^2 - 7a - 18 = 0$

$\hookrightarrow a^2 - 7a - 144 = 0 \Rightarrow (a+9)(a-16) = 0 \rightarrow a \nearrow \frac{9}{8}$, $\searrow 2$

۷- $x^2 - (a+1)x + a = 0 \xrightarrow{a+b+c=0} a=1$, $B \nearrow -1$ ✗ , $\searrow 3$ ✓ $\Rightarrow (x-1)(x-2) = x^2 - 3x + 2$, $a=2$

$x^2 - (2a+1) + b = 0 \xrightarrow{a=2} x^2 - 4x + b = 0$

$z(z+2) = \frac{c}{a} \Rightarrow z^2 + 2z = b \quad z + z + 2 = \frac{-b}{a} \Rightarrow z = 2$

$z(z+2) - a\beta \xrightarrow{z=2, a=1, \beta=3} 4 \times 4 - 1 \times 3 = 21$

۸- $y = -ax^2 + ax + 2 \longrightarrow \frac{-b}{2a} = \frac{-a}{-2a} = \frac{1}{2} \quad \frac{-\Delta}{4a} = \frac{a}{4} + 2$

$y = 2bx^2 - bx - 1 \longrightarrow \frac{-b}{2a} = \frac{b}{4b} = \frac{1}{4} \quad \frac{-\Delta}{4a} = \frac{-b}{8} - 1$

$2b\left(\frac{1}{2}\right)^2 - b\left(\frac{1}{4}\right) - 1 = \frac{a}{4} + 2 \Rightarrow \frac{a}{4} = -2 \Rightarrow a = -12$

$12\left(\frac{1}{4}\right)^2 - 12\left(\frac{1}{4}\right) + 2 = \frac{-b}{8} - 1 \Rightarrow \frac{3}{4} = \frac{-b}{8} \Rightarrow -b = -6 \quad b - a = (-6) - (-12) = 6$

۹- $y = 25ax^2 + 5x + \beta \longrightarrow m(x-a)(x-\beta) = mx^2 - m(a+\beta) + ma\beta$

$m = 25a \quad -m(a+\beta) = 5 \quad ma\beta = \beta \xrightarrow{m=25a} 25a^2 = 1 \Rightarrow a = \pm\frac{1}{5} \Rightarrow m = \pm 5$

$\pm 5\left(\pm\frac{1}{5} + \beta\right) = 5 \longrightarrow \pm\frac{1}{5} + \beta = \mp\frac{5}{5} \Rightarrow \beta$ ✓ $+1$, -1 ✗ $\quad \beta > a \rightarrow -1 > -\frac{1}{5}$ ✗

$25a < 0$, $\frac{-5}{-10} = \frac{-b}{2a} > 0$ ، پس سهمی در ربع اول

۱۰- $x^2 - (a^2 + b^2 - 12)x + a + b - 1 = 0 \quad a + b = a^2 + b^2 - 12 \Rightarrow x^2 - (a^2 + b^2 - 12)x + \underline{a+b} - 1$

$\xrightarrow{a+b+c=0} a = 1$, $b = a^2 + b^2 - 12$

$a + b = a^2 + b^2 - 12 \xrightarrow{a=1} (b-3)(b+2) = 0 \Rightarrow b$ ✓ $3 \Rightarrow x^2 - 5x + 4 \Rightarrow a + b = 5 = a^2 + b^2 - 12$

$-2 \Rightarrow x^2 + 2x - 3 \times \rightarrow -3 \notin N$