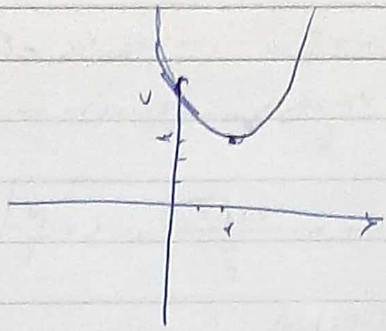
یازدهم تجربی — فاطمه [illegible] - ۱۲

Date No

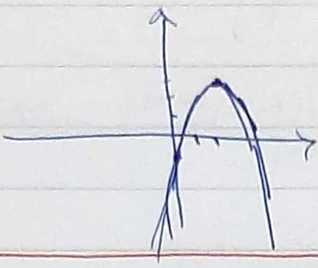
1- الف) $y = x^2 - 4x + 7$ $\quad \text{ext} \left| \begin{matrix} 2 \\ 3 \end{matrix} \right.$ $\quad a > 0$



ب) $y = -x^2 + 4x - 1$

$a < 0$

$\text{ext} \left| \begin{matrix} 2 \\ 3 \end{matrix} \right.$ $\quad x = \dfrac{-4 \pm \sqrt{16-4}}{-2}$



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

الف) $\Delta > 0 \to (m+1)^2 - 4m - 16 > 0 \to m^2 + 2m + 1 - 4m - 16 > 0 \to m^2 - 2m - 15 > 0 \to (m-5)(m+3) > 0$

$m \in \mathbb{R} - [-3, 5]$ $\quad \begin{array}{ccccc} & -3 & & 5 & \\ + & | & - & | & + \end{array}$

ب) $\Delta = 0 \to (m-5)(m+3) = 0 \Rightarrow \begin{cases} m = 5 \\ m = -3 \end{cases}$

ج) $\Delta < 0 \to (m-5)(m+3) < 0 \to \begin{array}{ccccc} & -3 & & 5 & \\ + & | & - & | & + \end{array} \Rightarrow m \in (-3, 5)$

د) $\Delta \geq 0 \to (m-5)(m+3) \geq 0 \to m \in (-\infty, -3] \cup [5, +\infty)$

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

الف) $S < 0 \to -\dfrac{b}{a} < 0 \to \dfrac{2m+2}{m-2} < 0 \to \begin{array}{ccccc} & -1 & & 2 & \\ + & | & - & | & + \end{array} \Rightarrow m \in (-1, 2)$

$P > 0 \to \dfrac{10}{m-2} > 0 \to \begin{array}{ccc} & 2 & \\ - & | & + \end{array} \to m \in (2, +\infty)$

$\xrightarrow{\cap} m = \varnothing$

ب) $P < 0 \to \dfrac{10}{m-2} < 0 \to m \in (-\infty, 2)$

$S < 0 \to m \in (-1, 2)$

$\xrightarrow{\cap} m \in (-1, 2)$

4- $y = (m-2)x^2 - 2(m+1)x + 10 \to \Delta > 0 \to$ مختلف‌العلامه

الف) $a > 0 \to$ $\to P < 0 \to \dfrac{10}{m-2} < 0 \Rightarrow m \in (-\infty, 2)$

$a < 0 \to$ $\to P < 0 \to \dfrac{10}{m-2} < 0 \Rightarrow m \in (-\infty, 2)$

$\xrightarrow{\cap} m \in (-\infty, 2)$

ب) $\dfrac{m+1}{m-2} = -2 \xrightarrow{m \neq 2} m+1 = -2m+4 \to 3m = 3 \Rightarrow \boxed{m = 1}$

5- $\frac{2x^2}{3} - (2\sin\alpha)x + \frac{3}{2} = 0 \to 4\sin^2\alpha - 4 \geq 0 \to \sin^2\alpha \geq 1 \to -1 \leq \sin\alpha \leq 1 \Rightarrow \sin\alpha = \pm 1$

$S > 0 \to -\frac{b}{a} > 0 \to \frac{2\sin\alpha}{\frac{2}{3}} \geq 0 \to 3\sin\alpha > 0 \Rightarrow \sin\alpha > 0 \Rightarrow \sin\alpha = 1$

$\Rightarrow \frac{2x^2}{3} - 2x + \frac{3}{2} = 0 \to x = \frac{2 \pm \sqrt{0}}{\frac{4}{3}} \Rightarrow \boxed{x = \frac{3}{2}}$

6- $y = \frac{(3x^2-2x-1)(2x^2-3x-5)}{1-x^2} = \frac{(3x+1)(x-1)(2x-5)(x+1)}{(1-x)(1+x)} \xrightarrow{x \neq \pm 1} -(3x+1)(2x-5) = y$

$\to y = -6x^2 + 13x + 5 \to y_{max} = -\frac{\Delta}{4a} = \frac{289}{24}$

7- $mx^2 - (m+2)x - 2 = 0$

$3S = 5P + 7 \to \frac{3m+6}{m} = \frac{-10}{m} + \frac{7m}{m} \to \frac{3m+6}{m} = \frac{7m-10}{m} \xrightarrow{m \neq 0} 3m + 6 = 7m - 10$

$4x^2 - 6x - 2 = 0 \Leftarrow 4m = 16 \Rightarrow m = 4$

$\to S^2 - 2P = \alpha^2 + \beta^2 \Rightarrow S^2 - 2P = \frac{9}{4} + \frac{4}{4} = \frac{13}{4}$

8- $x^2 - 5x + 2 = 0 \qquad \alpha\beta = 2 \qquad \alpha + \beta = 5$

$\frac{4\alpha + \beta^5}{5\beta^2} = \frac{4\alpha}{5\beta^2} + \frac{\beta^3}{5} = \frac{4\alpha^3}{5\alpha^2\beta^2} + \frac{\beta^3}{5} = \frac{4\alpha^3}{5 \times 4} + \frac{\beta^3}{5} = \frac{\alpha^3 + \beta^3}{5} = \frac{(\alpha+\beta)^3 - 3(\alpha\beta)(\alpha+\beta)}{5}$

$\frac{125 - 3 \times 2 \times 5}{5} = \frac{25 - 6}{1} = 19$

9- $y_1 = ax^2 + bx + \underset{4}{\underset{\downarrow}{c}} \qquad y_2 = 2x + 10 \qquad \left|\begin{matrix} 2 \\ \alpha \end{matrix}\right. \quad \left|\begin{matrix} -3 \\ \beta \end{matrix}\right.$

$\left.\begin{matrix} \to 4a + 2b + 4 = 14 \to 2a + b = 5 \\ \to 9a - 3b + 4 = 4 \to 3a - b = 0 \end{matrix}\right\} 5a = 5 \Rightarrow a = 1, b = 3 \Rightarrow y_1 = x^2 + 3x + 4 \to -\frac{b}{2a} = -\frac{3}{2}$

10- $y = 2x^2 + (m+1)x + m + 6 \qquad y = x$

$\to 2x^2 + mx + m + 6 = 0 \to \Delta = 0 \to m^2 - 8m - 48 = 0 \to (m-12)(m+4) = 0 \to \begin{matrix} m = -4 \\ m = 12 \end{matrix}$