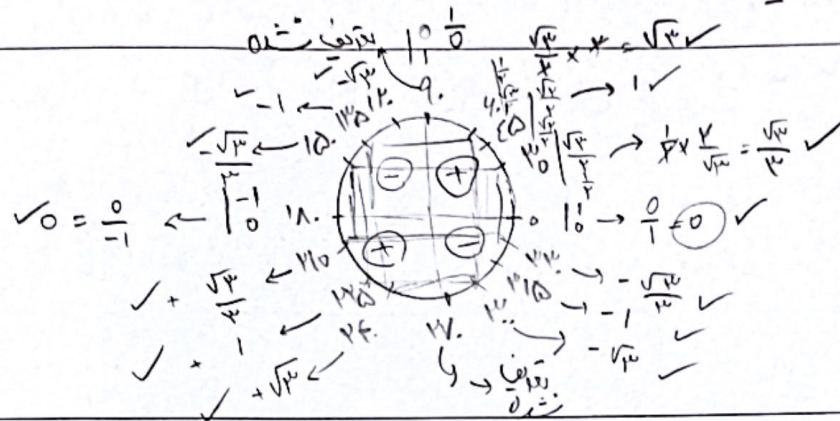




۱

الف) $\frac{1}{2} - \frac{2}{2} - \frac{2}{2} = -\frac{5}{2}$

د) $\cos\left(\frac{\pi}{2}\right) + \sin\left(\frac{\pi}{2}\right) = 0 + 1 = 1$

۲

ب) $\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - \left(\frac{1}{2} - \frac{1}{2}\right) = \frac{2\sqrt{3}}{2} + \frac{0}{2} = \sqrt{3}$

ج) $\frac{11\sqrt{3}}{12} - \frac{\sqrt{3}}{12} + \frac{3\sqrt{3}}{12} = \frac{13\sqrt{3}}{12}$

۳

$x^2 + a + 2 = 0$

$x^2 + 2 = 0$

$x^2 = -2$

$x = -1$

$a \rightarrow -1 \rightarrow f(1)$

$a = -1 \rightarrow x^2 + 2x \rightarrow f(1) = 1 + 2 = 3$

۴

$1 \leq -x^2 + 1 \leq -2$

$x+1 \geq 2 \rightarrow x \geq 1$

$a+b = 2$

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

۵

الف) $x^3 - 2x^2 \neq 0 \rightarrow x^2(x-2) \neq 0 \rightarrow \mathbb{R} - \{0, 2\}$

ب) $x^3 + 2x^2 + 2x + 2$

$x^2(x+2) + 2x+2 \quad \mathbb{R} - \{2\}$

$(x^2+1)(x+2) \rightarrow x^2+2 \neq 0 \rightarrow x \neq -2 \rightarrow x \neq -1$

الف) $m^2 - 1 \geq 0 \rightarrow (m-1)(m+1) \geq 0$. $\frac{-1}{+1} \frac{1}{0} \frac{1}{+1} (1, +\infty) \cup (-\infty, -1]$ I

$m - 2 \geq 0 \rightarrow m \geq 2 \rightarrow [2, +\infty)$ II $I \cap II = [2, +\infty)$

ب) $4 - 3m \geq 0 \rightarrow 3m \leq 4 \rightarrow m \leq \frac{4}{3}$

$4m - 2 \geq 0 \rightarrow 4m \geq 2 \rightarrow 2m \geq 1 \rightarrow m \geq \frac{1}{2} \left(\frac{1}{2}, 2\right]$

$\frac{4x^2}{12} - a = 0 \rightarrow a = \frac{1}{3}$

if $m = 2$ $b - 3m = 0 \rightarrow b - 4 = 0 \rightarrow b = 4$

$\frac{b}{a} = \frac{4}{\frac{1}{3}} = 12$

الف) $(m-3)(m+2)$ $\frac{3}{0} \frac{-2}{0}$ $\frac{-3}{0} \frac{-2}{0}$ $\frac{1}{0} \frac{2}{0}$ $\frac{3}{0}$

if $m = 2 \rightarrow 2^2 - 1^2 \cdot 2 + 4 \rightarrow (2-1)(2-2)$ $\frac{2}{0} \frac{-1}{0} \frac{2}{0}$ $\frac{1}{0} \frac{2}{0}$ $\frac{3}{0}$

$(-\infty, 3) \cup (2, 3) \cup (3, +\infty)$

الف) $(m-1)(m^2 - m - 4)$ $\frac{1}{0} \frac{1}{0} \frac{-4}{0}$ $\frac{-1}{0} \frac{-1}{0} \frac{-4}{0}$ $\frac{1}{0} \frac{2}{0} \frac{3}{0}$ $(-\infty, 2) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

ب) $\frac{(m-1)(m^2 - m - 4)}{(m+1)(m^2 + m - 4)} \geq 0$ $\frac{-1}{0} \frac{-1}{0} \frac{-4}{0}$ $\frac{1}{0} \frac{2}{0} \frac{3}{0}$ $(-\infty, 2) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

الف) $\sqrt{[m] - 1} \geq 0 \rightarrow \sqrt{[m]} \geq 1 \rightarrow [m] \geq 1 \rightarrow m \geq 1$

ب) $\sqrt{[m] - \omega} \geq 0 \rightarrow \sqrt{[m]} \geq \omega \rightarrow [m] \geq \omega^2 \rightarrow m \geq \omega^2$

الف) $\frac{m+1}{|m-3|} \geq 0$ $m+1 \geq 0 \rightarrow m \geq -1$ $|m-3| > 0 \rightarrow m \neq 3$ $m-3 < 0 \rightarrow m < 3$ $m-3 \neq 0 \rightarrow m \neq 3$

$4 - m \geq 0 \rightarrow m \leq 4$ $\frac{-1}{0} \frac{4}{0}$ $\frac{-1}{0} \frac{4}{0}$ $[-1, 3) \cup (3, 4]$

$[m] - 1 \geq 0 \rightarrow [m] \geq 1 \rightarrow m \geq 1$ I $\sqrt{[m]} \geq 0 \rightarrow [m] \geq 0 \rightarrow m \geq 0$ II