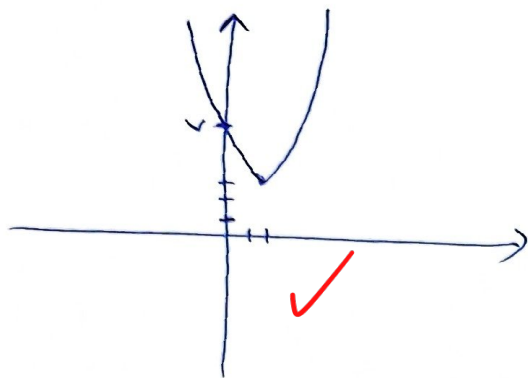


19, 5

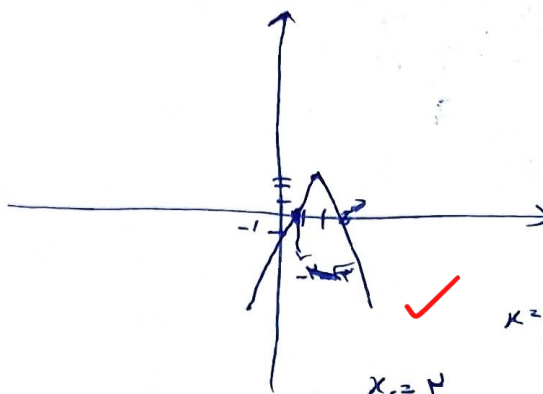
15/5/20

الف



$$x = 2 \pm \sqrt{4-4} \quad x_3 = 2$$

$$y_3 = 2$$



$$x_3 = 2$$

$$y_3 = 2$$

$$x = \frac{-1 \pm \sqrt{1-4}}{2} = -\frac{1 \pm \sqrt{3}}{2}$$

(2)

الف) $\Delta > 0 \rightarrow (m+1)^2 - 4\left(\frac{m}{2}\right)\left(\frac{m}{2} + 1\right) > 0 \rightarrow m^2 + 2m + 1 - 4\left(\frac{m^2}{4} + m\right) > 0 \rightarrow m^2 + 2m + 1 - m^2 - 4m > 0 \rightarrow -2m + 1 > 0 \rightarrow m < \frac{1}{2}$

ب) $\Delta = 0 \rightarrow m^2 + 2m + 1 - 4\left(\frac{m}{2}\right)\left(\frac{m}{2} + 1\right) = 0 \rightarrow m^2 + 2m + 1 - m^2 - 4m = 0 \rightarrow -2m + 1 = 0 \rightarrow m = \frac{1}{2}$

ج) $\Delta < 0 \rightarrow m^2 + 2m + 1 - 4\left(\frac{m}{2}\right)\left(\frac{m}{2} + 1\right) < 0 \rightarrow -2m + 1 < 0 \rightarrow m > \frac{1}{2}$

د) $\Delta \geq 0 \rightarrow m^2 + 2m + 1 - 4\left(\frac{m}{2}\right)\left(\frac{m}{2} + 1\right) \geq 0 \rightarrow m \in \mathbb{R} - \left(\frac{1}{2}, \infty\right)$

الف) $\frac{1}{m-2} < \frac{1}{m+2} \rightarrow \frac{1}{m-2} - \frac{1}{m+2} < 0 \rightarrow \frac{m+2 - (m-2)}{(m-2)(m+2)} < 0 \rightarrow \frac{4}{(m-2)(m+2)} < 0 \rightarrow (m-2)(m+2) > 0 \rightarrow m < -2 \text{ or } m > 2$

ب) $\Delta > 0 \rightarrow (m+1)^2 - 4(1)(m-2) > 0 \rightarrow m^2 + 2m + 1 - 4m + 8 > 0 \rightarrow m^2 - 2m + 9 > 0$

ج) $\Delta < 0 \rightarrow -1 < m < 2$

د) $-1 < m < 2 \rightarrow m \in (-1, 2)$

$$m = \frac{1 \pm \sqrt{1-4}}{2} \rightarrow \Delta < 0 \rightarrow \text{no real roots}$$

الف) $\Delta > 0 \rightarrow (m+1)^2 - 4(1)(m-2) > 0 \rightarrow m^2 + 2m + 1 - 4m + 8 > 0 \rightarrow m^2 - 2m + 9 > 0$

ب) $x_3 = -2 \Rightarrow \frac{1 + (m+1)}{2(m-2)} = -2 \rightarrow \frac{m+2}{2(m-2)} = -2 \rightarrow m+2 = -4(m-2) \rightarrow m+2 = -4m+8 \rightarrow 5m = 6 \rightarrow m = \frac{6}{5}$

$\Delta \geq 0 \rightarrow 15 \sin^2 \alpha - 4\left(\frac{1}{2}\right)\left(\frac{1}{2}\right) \geq 0 \rightarrow 15 \sin^2 \alpha - 1 \geq 0 \rightarrow \sin^2 \alpha \geq \frac{1}{15} \rightarrow \sin \alpha = \pm \frac{1}{\sqrt{15}}$

ج) $\sin \alpha \in \left\{ \frac{1}{\sqrt{15}}, -\frac{1}{\sqrt{15}} \right\}$

د) $\sin \alpha \in \left\{ k\pi + \frac{\pi}{2} \mid k \in \mathbb{Z} \right\}$

$\sin \alpha = 1 \rightarrow \frac{1}{2} - 1 + \frac{1}{2} = 0 \rightarrow (1-1)^2 = 0 \rightarrow u = \frac{1}{2}$

$$y = (x-1)(x+\frac{1}{4})(x+1)(x-\frac{5}{4}) = (\frac{5}{4}-x)(x+\frac{1}{4}) = -x^2 - \frac{x}{4} + \frac{5}{4}x + \frac{5}{4} = -x^2 + \frac{13}{4}x + \frac{5}{4} = 0$$

$$\rightarrow x^2 - \frac{13}{4}x - \frac{5}{4} = 0$$

$$\Delta = \left(\frac{13}{4}\right)^2 - 4 \cdot 1 \cdot \left(-\frac{5}{4}\right) = \frac{169}{16} + \frac{20}{4} = \frac{169}{16} + \frac{80}{16} = \frac{249}{16}$$

$$\frac{-\frac{13}{4} \pm \sqrt{\frac{249}{16}}}{2 \cdot 1} = \frac{-\frac{13}{4} \pm \frac{\sqrt{249}}{4}}{2} = \frac{-13 \pm \sqrt{249}}{8}$$

نوشته ضرب در 4
برای حذف کسرها

(1) جواب درست روحانزدی !!

$3(s) - v = \omega p$

$3\left(\frac{m+4}{m}\right) - v = \omega\left(-\frac{2}{m}\right)$

$3m+4-vm = -1 \rightarrow 3m = 14 \rightarrow m = \frac{14}{3}$ ✓

$\rightarrow 3x^2 - 4x - 2 = 0$

$\alpha^2 + \beta^2 = 5^2 - 2p = \left(\frac{3}{4}\right)^2 - 2\left(-\frac{1}{4}\right) = \frac{9}{16} + \frac{1}{2} = \frac{17}{8}$ ✓

(2) ✓

$\alpha\beta = 2 \rightarrow \alpha = \frac{2}{\beta}$

$\frac{2\alpha + \beta^2}{\omega\beta^2} = \frac{2}{\omega} \cdot \frac{\alpha}{\beta^2} + \frac{\beta^2}{\omega} = \frac{1}{\omega\beta^2} + \frac{\beta^2}{\omega}$

$\beta^2 = \omega\beta - 2 \rightarrow \beta^2 = 4\omega\beta^2 + 4 - 2\beta = 2\omega(\omega\beta - 2) + 4 - 2\beta$
 $\beta^2 = 6\omega\beta - 2 \rightarrow \beta^2 = 10\omega(\omega\beta - 2) - 4\beta = 10\omega^2\beta - 20\omega - 4\beta - 2$
 $\beta^2 = 4\omega\beta - 2$

$\alpha + \beta = 0 \rightarrow \alpha = -\beta \rightarrow 3\alpha = 2 - 4\beta$

$\frac{3\alpha + \beta^2}{\omega\beta^2} = \frac{2 - 4\beta + 4\omega\beta - 2}{\omega(\omega\beta - 2)} = \frac{4\omega\beta - 4}{2\omega\beta - 4} = \frac{2\omega\beta - 2}{\omega\beta - 2} = 19$ ✓

(2) ✓

$\begin{vmatrix} 1 & 4 \\ 1 & 4 \end{vmatrix} \rightarrow 4a + 4b + c = 14 \quad \begin{vmatrix} 1 & 3 \\ 1 & 3 \end{vmatrix} \rightarrow 9a - 3b + c = 4 \rightarrow \omega a - \omega b = -1 \rightarrow a - b = -2 \rightarrow a + 2 = b$

$\begin{vmatrix} 0 & 4 \\ 1 & 4 \end{vmatrix} \rightarrow c = 4 \rightarrow 4a + 4a + 4 + 4 = 14 \rightarrow 8a = 6 \rightarrow a = \frac{3}{4}$

$2x^2 + 3x + 4 \rightarrow x_2 = -\frac{3}{2}$
 $\Rightarrow x = -\frac{3}{2}$ ✓

(2) 9

$\frac{b}{a} = \frac{1}{x} \rightarrow \frac{-b}{a} = -\frac{b^2 + 4a}{a} \rightarrow \frac{m+1}{x \cdot x} = \frac{(m+1)^2 - 11(m+4)}{x \cdot x}$
 $\frac{m+1}{x} = \frac{(m+1)^2 - 11(m+4)}{x^2}$

$11m+12 = m^2 + 11m + 1 - 11m - 44 \Rightarrow m^2 - 11m - 59 = 0 \rightarrow m = \frac{11 \pm \sqrt{121 + 236}}{2} = \frac{11 \pm \sqrt{357}}{2}$



$\frac{m+4}{x} > 0 \Rightarrow m > -4 \rightarrow m = \frac{11 + \sqrt{357}}{2}$

تابع را با خط $y = v$ قطع کرده و $\Delta = 0$ قدر مدهیم:

$2v^2 + (m+1)v + m + 4 = 0 \rightarrow 2v^2 + mv + m + 4 = 0$

$\Delta = 0 \rightarrow m^2 - 11(m+4) = 0 \rightarrow \begin{cases} m = 12 \rightarrow \text{ناصحی} \\ m = -4 \rightarrow \text{ناصحی اول} \end{cases}$