

نقطة A من Δ_m المميز : 2

$$4m(1) + (3m+2)(2) + 2m - 3 = 0$$

$$4m + 6m + 4 + 2m - 3 = 0 \rightarrow 12m + 1 = 0$$

$$m = -\frac{1}{12} \quad (1)$$

(2) معامل توصيل Δ_m : $\frac{-4m}{3m+2}$

$$\vec{u} \begin{pmatrix} 2 \\ 2 \end{pmatrix} \parallel \vec{u}' \begin{pmatrix} -(3m+2) \\ 4m \end{pmatrix} \quad (3)$$

$$(2)(4m) - (2)[-(3m+2)] = 0$$

$$8m + 6m + 4 = 0 \rightarrow 14m = -4 \rightarrow m = -\frac{4}{14}$$

$$\vec{AO} \begin{pmatrix} 0-1 \\ 0-2 \end{pmatrix} = \begin{pmatrix} -1 \\ -2 \end{pmatrix} \perp \vec{u}' \begin{pmatrix} -(3m+2) \\ 4m \end{pmatrix} \quad (4)$$

$$(-1)[-(3m+2)] - (-2)(4m) = 0$$

$$3m + 2 - 8m = 0 \rightarrow -5m = -2 \rightarrow m = \frac{2}{5}$$

$$4m \left(-\frac{13}{8} \right) + (3m+2) \left(\frac{3}{2} \right) + 2m - 3 = 0 \quad (4)$$

$$-\frac{13}{2}m + \frac{9m}{2} + 3 + 2m - 3 = 0$$

$$-\frac{13m}{2} + \frac{9m}{2} + \frac{4m}{2} = 0$$

$$m = 0 \quad (5)$$

نقطة 3

$$f(x) = \frac{-x+3}{x-2}$$

$$f(x) = -1 + \frac{1}{x-2} = \frac{-1(x-2)}{x-2} + \frac{1}{x-2}$$

$$= \frac{-x+2+1}{x-2} = \frac{-x+3}{x-2} \quad (6)$$

$$x \in]-\infty, 2[\cup]2, +\infty[$$

$$x_1 < x_2 \rightarrow x_1 - 2 < x_2 - 2$$

$$\frac{1}{x_1-2} > \frac{1}{x_2-2} \rightarrow -1 + \frac{1}{x_1-2} > -1 + \frac{1}{x_2-2}$$

$$f(x_1) > f(x_2)$$

f متناقصة كما على

(1)

$$\vec{AB} \begin{pmatrix} -1+2 \\ -\frac{1}{2}-1 \end{pmatrix} \begin{pmatrix} 1 \\ -\frac{3}{2} \end{pmatrix} \parallel \vec{u} \begin{pmatrix} -2 \\ 3 \end{pmatrix} \quad (1)$$

$$1 \cdot 3 - \left(-\frac{3}{2}\right)(-2) = 3 - 3 = 0$$

(d) منقطة B من Δ_m : $\vec{AB} \parallel \vec{u}$

$$\vec{u} \begin{pmatrix} -2 \\ 3 \end{pmatrix} \parallel \vec{AB} \begin{pmatrix} x-1 \\ y-1 \end{pmatrix} : -2(y-1) - 3(x-1) = 0 \quad (2)$$

$$-2y + 2 - 3x + 3 = 0 \rightarrow -3x - 2y - 4 = 0 \quad (3)$$

الخطاف مع محور التوازي : $y = \frac{3}{2}x - 2$

$$-3(0) - 2y - 4 = 0 \rightarrow 2y = -4 \rightarrow y = -2 \quad (4)$$

الخطاف مع محور التوازي :

$$-3x - 2(0) - 4 = 0 \rightarrow -3x = 4 \rightarrow x = -\frac{4}{3} \quad (5)$$

$$\vec{BC} \begin{pmatrix} x_c+1 \\ y_c+\frac{1}{2} \end{pmatrix} = 2 \begin{pmatrix} 0+2 \\ 0-1 \end{pmatrix} \quad (6)$$

$$\begin{cases} x_c+1 = 4 \\ y_c+\frac{1}{2} = -2 \end{cases} \rightarrow \begin{cases} x_c = 3 \\ y_c = -\frac{5}{2} \end{cases} \quad (7)$$

$$C \left(3, -\frac{5}{2} \right) \quad (8)$$

$$\vec{BC} \begin{pmatrix} 4 \\ -2 \end{pmatrix} \parallel \vec{BT} \begin{pmatrix} x+1 \\ y+\frac{1}{2} \end{pmatrix}$$

$$4 \left(y + \frac{1}{2} \right) - (-2)(x+1) = 0 \quad (9)$$

$$4y + 2 + 2x + 2 = 0 \rightarrow 2x + 4y + 4 = 0 \quad (10)$$

$$y = \frac{1}{2}x - 1 \quad (11)$$

$$\vec{u} \begin{pmatrix} -2 \\ 3 \end{pmatrix} \parallel \vec{BT} \begin{pmatrix} x-u \\ y-u \end{pmatrix}$$

$$-2(y-u) - 3(x-u) = 0 \rightarrow -3x - 2y + 8 = 0 \quad (12)$$

$$y = \frac{3}{2}x + 4 \quad (13)$$

(12) و (13) : (BC)

$$\begin{cases} -3x - 2y + 8 = 0 \\ 2x + 4y + 4 = 0 \end{cases} \rightarrow \begin{cases} -6x - 4y + 16 = 0 \\ 2x + 4y + 4 = 0 \end{cases}$$

$$-3x - 2y + 8 = 0$$

$$2x + 4y + 4 = 0$$

$$-\frac{3}{2} + \frac{-6}{4} \quad \text{بالجمع} : -4x + 12 = 0$$

$$-4x = -12 \rightarrow x = 3$$

$$-3(3) - 2y + 8 = 0$$

$$-2y - 1 = 0 \rightarrow y = -\frac{1}{2}$$

$$\left(3, -\frac{1}{2} \right) \quad (14)$$

(7) الرسم

$$h(x) = g(x) + \beta \quad (7)$$

(cf) هو انحناء منحنى الدالة (cf) بشعاع

$$\vec{v} \begin{pmatrix} 0 \\ \beta \end{pmatrix} \text{ عند الجان } \left. \begin{array}{l} \beta = 2 \\ \beta = -2 \end{array} \right\} \text{ (0,1)}$$

تقبل أي نقطة قريبة من 2 أو -2

تقدر (4)

$$\frac{2022\pi}{5} = \frac{2\pi}{5} / \frac{1443\pi}{2} = \pi + \frac{\pi}{2} = \frac{3\pi}{2}$$

$$135^\circ = \frac{3\pi}{4} / \frac{102\pi}{3} = 0 \quad (0,1) \times 4$$

$$A(x) = 2 \cos(\pi - x) + 4 \sin(x - \pi) + \cos(x - \pi)$$

$$= 2 \cos x + 4 \sin[-(\pi - x)] + \cos[-(\pi - x)]$$

$$= -2 \cos x - 4 \sin x + \cos(\pi - x) \quad (0,1)$$

$$= -2 \cos x - 4 \sin x - \cos x = -3 \cos x - 4 \sin x$$

$$E\left(\frac{5\pi}{4}\right) = \cos^2\left(\frac{5\pi}{4}\right) - \sin^2\left(\frac{5\pi}{4}\right) = 0 \quad (0,1)$$

$$E(x) = \cos^2 x - \sin^2 x = \cos^2 x - (1 - \cos^2 x)$$

$$= 2 \cos^2 x - 1 \quad (0,1)$$

$$E(x) = \frac{1}{2} \rightarrow 2 \cos^2 x - 1 = \frac{1}{2} \quad (4)$$

$$2 \cos^2 x = \frac{3}{2} \rightarrow \cos^2 x = \frac{3}{4} \rightarrow \begin{cases} \cos x = -\frac{\sqrt{3}}{4} \\ \cos x = \frac{\sqrt{3}}{4} \end{cases} \text{ مرفوض}$$

$$\cos x = -\frac{\sqrt{3}}{4} = -\frac{\sqrt{3}}{2} \quad (0,1)$$

$$\cos x = -\frac{\sqrt{3}}{2} \rightarrow \begin{cases} x = \frac{5\pi}{6} \\ x = \frac{7\pi}{6} \end{cases} \text{ مرفوض}$$

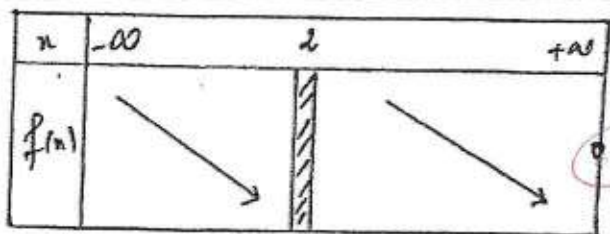
$$\cos^2 x + \sin^2 x = 1 \rightarrow \left(\frac{\sqrt{3}}{2}\right)^2 + \sin^2 x = 1$$

$$\sin^2 x = 1 - \frac{3}{4} \rightarrow \sin^2 x = \frac{1}{4}$$

$$\sin x = +\sqrt{\frac{1}{4}} = \frac{1}{2} \quad (0,1)$$

$$\sin x = -\sqrt{\frac{1}{4}} = -\frac{1}{2} \rightarrow \text{مرفوض}$$

$$\begin{cases} \cos x = -\frac{\sqrt{3}}{2} \\ \sin x = \frac{1}{2} \end{cases} \rightarrow x = \frac{5\pi}{6}$$



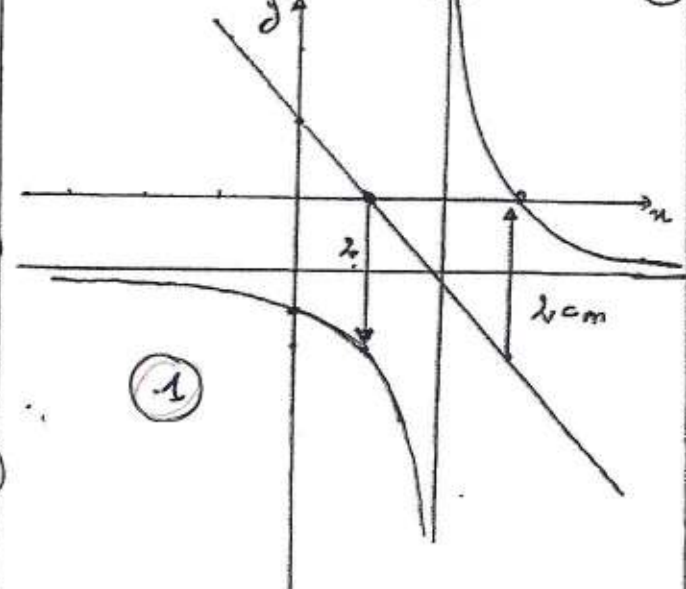
(3) هو انحناء منحنى الدالة $\frac{1}{x}$

$$\vec{v} \begin{pmatrix} 2 \\ -1 \end{pmatrix} \text{ بشعاع (0,1)}$$

$$f(1) = \frac{0+3}{0-2} = -\frac{3}{2} \text{ : الزايب (0,1)}$$

$$f(x) = 0 \text{ : التقاطع مع محور الغواصل (0,1)}$$

$$-x + 3 = 0 \rightarrow x = 3 \quad (0,1)$$



$$g(x) = ax + b \quad A(1, 0) \quad (6)$$

$$a = \frac{1-0}{0-1} = -1 \quad B(0, 1)$$

$$g(x) = -x + b \rightarrow 1 = -(0) + b \rightarrow b = 1$$

$$g(x) = -x + 1 \quad (1)$$

$$f(x) - g(x) = \frac{-x+3}{x-2} - (-x+1)$$

$$= \frac{-x+3}{x-2} + \frac{(x-1)(x-2)}{x-2}$$

$$= \frac{-x+3 + x^2 - 3x + 2}{x-2} \quad (0,1)$$

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

$$f(x) - g(x) = 0 \rightarrow (x-2) + 1 = 0 \rightarrow (x-2)^2 = -1$$

مستحيل و من (cf) لا (cf) (0,1)