

الف) $m = \frac{-2-2}{2-4} = \frac{-4}{-2} = 2 \rightarrow y-2 = 2(x-4) \rightarrow y = 2x-6+4 \rightarrow y = 2x-2$

ب) $m' \perp m \rightarrow m' = -\frac{1}{m} = -\frac{1}{2}$ $y = 4x-1 \rightarrow y-4x+1 = 0$ $m' = -\frac{1}{2} \rightarrow y-4x+1 = -\frac{1}{2}(x-4) \rightarrow y-4x+1 = -\frac{1}{2}x+2 \rightarrow y = 4x-1-\frac{1}{2}x+2 \rightarrow y = \frac{7}{2}x+1$

ج) $\tan \theta = \frac{m_2 - m_1}{1 + m_1 m_2}$ $\tan \theta = \frac{2 - (-\frac{1}{2})}{1 + 2(-\frac{1}{2})} = \frac{2 + \frac{1}{2}}{1 - 1} = \frac{\frac{5}{2}}{0} \rightarrow \theta = 90^\circ$

د) $\frac{\pi}{4} = 45^\circ \rightarrow \tan 45^\circ = 1 = \frac{y-2}{x-4} \rightarrow y-2 = x-4 \rightarrow y = x-2$

الف) $\Delta = \sqrt{(2+1)^2 + (2-2)^2} = \sqrt{9+0} = 3$

ب) $2x+3y-3=0 \rightarrow \frac{|2(2)+3(2)-3|}{\sqrt{2^2+3^2}} = \frac{|4+6-3|}{\sqrt{13}} = \frac{7}{\sqrt{13}}$

الف) $ax+by+c=0 \rightarrow 2x+3y+4=0 \rightarrow 2x+3y=-4$

ب) $\frac{2x+3y+4}{\sqrt{2^2+3^2}} = \frac{|4-4|}{\sqrt{13}} = \frac{0}{\sqrt{13}} = 0$

الف) $\frac{|2x-3y-1|}{\sqrt{2^2+3^2}} = \frac{|2x+3y-3|}{\sqrt{2^2+3^2}} \rightarrow 2x-3y-1 = 2x+3y-3 \rightarrow -6y = -2 \rightarrow y = \frac{1}{3}$

ب) $2x-3y-1 = 2-2x-3y \rightarrow 4x = 3 \rightarrow x = \frac{3}{4}$

$m = -2$ $m = 2$

$\tan \alpha = \left| \frac{-2-2}{1-4} \right| = 1 \rightarrow \alpha = \frac{\pi}{4} \in \Delta$

الف) $\sqrt{(2+2)^2 + (-2-2)^2} = \sqrt{16+16} = \sqrt{32} = 4\sqrt{2}$

ب) $x_M = \frac{2-2}{2} = 0$ $y_M = \frac{-2+2}{2} = 0 \rightarrow M(0,0)$

الف) $x_G = \frac{-1-2+2}{2} = -\frac{1}{2}$ $y_G = \frac{-1-2+2}{2} = -\frac{1}{2} \rightarrow G(-\frac{1}{2}, -\frac{1}{2})$

ب) $\begin{vmatrix} -1 & -2 & 1 \\ 1 & 2 & 1 \\ 2 & 1 & 1 \end{vmatrix} = 1(-2-2) - 1(-1-2) + 1(-1-2) = -4+3-3 = -4$

$S = \frac{94}{2} = 47$

الف) $-y = \frac{2x+1}{2x-2}$ $ب) y = \frac{-2x+1}{-2x-2}$

ج) $x = \frac{2y+1}{2y-2} \rightarrow y = \frac{2x+1}{2x-2}$

د) $-x = \frac{-2y+1}{-2y-2} \rightarrow -y = \frac{-2x-1}{-2y-2}$

$y = \frac{-2x+1}{2x+2}$

8
ا) $\begin{cases} x' : x-2 \rightarrow x = x'+2 \\ y' : y+2 \rightarrow y = y'-2 \end{cases} \rightarrow y' = 2, \frac{2(x'+2)+1}{(x'+2)-3} \rightarrow y' = \frac{2x'+5}{x'-1}$

9
ب) $\begin{cases} x' : x-2 \rightarrow x = x'+2 \\ y' : y-2 \rightarrow y = y'+2 \end{cases} \rightarrow y' + 2 = \frac{2(x'+2)+1}{(x'+2)-3} \rightarrow y' = \frac{1}{x'}$ (1,0)

10
ا) $\begin{cases} 2x + 4y = 2 \\ x - 5y = 1 \end{cases} \xrightarrow{2-2} \begin{cases} 2x + 4y = 2 \\ -2x + 10y = 2 \end{cases} \rightarrow \begin{cases} 2x + 4y = 2 \\ 12y = 4 \end{cases} \rightarrow \begin{cases} 2x + 4y = 2 \\ y = \frac{1}{3} \end{cases} \rightarrow \begin{cases} 2x + 4(\frac{1}{3}) = 2 \\ y = \frac{1}{3} \end{cases} \rightarrow \begin{cases} 2x = \frac{2}{3} \\ y = \frac{1}{3} \end{cases} \rightarrow \begin{cases} x = \frac{1}{3} \\ y = \frac{1}{3} \end{cases}$

ب) $x = \frac{2+10}{-10-2} = \frac{12}{-12} = -1$
 $y = \frac{2-2}{-10-2} = \frac{0}{-12} = 0$