

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

ب) $m' \perp m \rightarrow m' = -\frac{1}{2}$ $y = 4x-1 \rightarrow y-2 = -\frac{1}{2}(x-4) \rightarrow y = -\frac{1}{2}x+3$

ج) $y = -x+1 \rightarrow y = -\frac{1}{2}x + \frac{1}{2} \rightarrow m' = 2 \rightarrow y-2 = 2(x-4) \rightarrow y = 2x-6$

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

الف) $\Delta = \sqrt{(2+1)^2 + (3-5)^2} = \sqrt{9+4} = \sqrt{13}$ ب) $2x+3y-3=0 \rightarrow \frac{|2(2)+3(3)-3|}{\sqrt{4+9}} = \frac{10}{\sqrt{13}}$

الف) $ax+by+\frac{c+c'}{2}=0 \rightarrow 2x+3y+\frac{4+4}{2}=0 \rightarrow 2x+3y+4=0$

ب) $\frac{2x+3y+4}{2x+3y+4} \rightarrow \frac{|4-4|}{\sqrt{4+9}} = \frac{0}{\sqrt{13}} = 0$

الف) $\frac{|2x-3y-1|}{\sqrt{4+9}} = \frac{|2x+3y-3|}{\sqrt{4+9}} \rightarrow \begin{cases} 2x-3y-1 = 2x+3y-3 \rightarrow x-3y = -1 \\ 2x-3y-1 = -(2x+3y-3) \rightarrow 4x = 2 \rightarrow x = \frac{1}{2} \end{cases}$

$m = -2 \quad m' = 2$

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

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

ب) $x_M = \frac{3-2}{2} = \frac{1}{2}$ $y_M = \frac{-2+2}{2} = 0 \rightarrow M(\frac{1}{2}, 0)$

الف) مرکز: $x_G = \frac{-1-2+3}{3} = 0$

$y_G = \frac{-1+2+1}{3} = \frac{2}{3}$

$G(0, \frac{2}{3})$

ب) $\begin{vmatrix} -1 & -2 & 1 \\ 2 & 3 & 1 \\ 3 & 1 & 1 \end{vmatrix} = \frac{1}{6}(-1 \cdot 3 + (-2) \cdot (-3) + (-1) \cdot 9 + 1 \cdot 0 - 2 \cdot 3) = \frac{1}{6}(-3 + 6 - 9 - 6) = \frac{1}{6}(-12) = -2$

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

الف) $-y = \frac{2x+1}{4x-2}$

ب) $y = \frac{-2x-1}{-4x-2}$

ج) $x = \frac{2y+1}{4y-2} \rightarrow y = \frac{2x+1}{4x-2}$

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

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

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

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ا) $\begin{cases} 2x + 4y = 2 \\ x - 5y = 1 \end{cases} \xrightarrow{2-2} \begin{cases} 2x + 4y = 2 \\ -2x + 10y = 2 \end{cases}$
 $\left. \begin{aligned} 10y = 2 \rightarrow y = \frac{1}{5} \\ 2x + 4\left(\frac{1}{5}\right) = 2 \rightarrow 2x = \frac{6}{5} \rightarrow x = \frac{3}{5} \end{aligned} \right\}$

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

$y = \frac{2-2}{-10-2} = \frac{0}{-12} = 0$