

الف) $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{2 - (-2)}{4 - 0} = -4$ $y - 2 = -4(x - 4)$
 $y - y_0 = m(x - x_0)$ $\Rightarrow y = -4x + 18$
 ب) $m = -\frac{4}{1} = -4$ $(y - 2) = -4(x - 4) \Rightarrow y = -4x + 18$
 ج) $m = -\frac{1}{4} \Rightarrow m' = \frac{-1}{-\frac{1}{4}} = 4$ $(y - 2) = 4(x - 4) \Rightarrow y = 4x - 10$
 د) $m = \tan \frac{\pi}{4} = 1$ $\Rightarrow (y - 2) = 1(x - 4) \Rightarrow y = x + 2 - 4 = x - 2$

الف) $\sqrt{(2 - (-1))^2 + (3 - 1)^2} = \sqrt{3^2 + 2^2} = 5$
 ب) $\frac{|ax_0 + by_0 + c|}{\sqrt{a^2 + b^2}} = \frac{|3 \times 2 + 4 \times 3 - 10|}{\sqrt{3^2 + 4^2}} = \frac{|10|}{5} = 2$
 $3x + 4y - 10 = 0$

$2x + 3y = 4$ $2x + 3y = 6$
 الف) $2x + 3y = \frac{4+6}{1} = 10$
 ب) $\frac{|c_1 - c_2|}{\sqrt{a^2 + b^2}} = \frac{|4 - 6|}{\sqrt{4 + 9}} = \frac{2}{\sqrt{13}}$

$2x + 3y - 3 = 0$

$3x - 2y - 1 = 0$

$\frac{|2x + 3y - 3|}{\sqrt{4 + 9}} = \frac{|3x - 2y - 1|}{\sqrt{9 + 4}} \Rightarrow$ (I) $2x + 3y - 3 = 3x - 2y - 1$
 $\Rightarrow 5y = x + 2 \Rightarrow y = \frac{x}{5} + \frac{2}{5}$
 (II) $2x + 3y - 3 = 1 + 2y - 3x$
 $\Rightarrow y = -5x + 4$

$\tan \alpha = \left| \frac{m - m'}{1 + mm'} \right| = \left| \frac{2 - (-3)}{1 + 2(-3)} \right| = \left| \frac{5}{-5} \right| = 1 \Rightarrow \alpha = 45^\circ$

$m = -\frac{2}{1} = -2$
 $m' = -\frac{3}{1} = -3$

$$\text{الف) } \sqrt{(3-(-5))^2 + (-2-4)^2} = \sqrt{8^2 + 4^2} = \boxed{10}$$

$$\text{ب) } M \begin{vmatrix} \frac{3+(-5)}{4} \\ -\frac{2+4}{4} \end{vmatrix} = \begin{vmatrix} M & -1 \\ & 1 \end{vmatrix}$$

$$\text{الف) } G \begin{vmatrix} \frac{3+(-2)}{3} \\ \frac{1+3+(-13)}{3} \end{vmatrix} \Rightarrow \begin{vmatrix} G & -3 \\ & -3 \end{vmatrix}$$

$$\text{ب) } \frac{1}{4} \begin{vmatrix} 3 & 1 & 1 \\ -2 & 3 & 1 \\ -10 & -13 & 1 \end{vmatrix} = \frac{1}{4} |9 + 24 - 10 + 30 + 39 + 2| = \frac{1}{4} |94| = \boxed{23.5}$$

$$\text{الف) } -\frac{2x+1}{5x-3} \quad (x, y) \rightarrow (x, -y)$$

$$\text{ب) } \frac{2(-x)+1}{5(-x)-3} = \frac{-2x+1}{-5x-3} \quad (x, y) \rightarrow (-x, y)$$

$$\text{ج) } y = \frac{2x+1}{5x-3} \Rightarrow x = \frac{3y+1}{5y-2} \quad (x, y) \rightarrow (y, x)$$

$$\text{د) } -x = \frac{2(-y)+1}{5(-y)-3} \Rightarrow x = -\frac{-2y+1}{-5y-3} = \frac{-2y+1}{5y+3} \Rightarrow y = -\frac{3x-1}{5x+3} \quad (x, y) \rightarrow (-y, -x)$$

$$\text{الف) } \begin{aligned} x' &= x-2 \Rightarrow x = x'+2 \\ y' &= y-(-3) \Rightarrow y = y'-3 \end{aligned} \quad y'-3 = \frac{2(x'+2)+1}{x'+2-3} = \frac{2x'+5}{x'-1} \Rightarrow y' = \frac{2x'+5+x'-1}{x'-1} = \frac{3x'+4}{x'-1}$$

$$\text{ب) } \begin{aligned} x' &= x-3 \Rightarrow x = x'+3 \\ y' &= y-2 \Rightarrow y = y'+2 \end{aligned} \quad y'+2 = \frac{2(x'+3)+1}{x'+3-2} = \frac{2x'+7}{x'+1} \Rightarrow y' = \frac{2x'+7}{x'+1} - 2 = \frac{2x'+7-2x'-2}{x'+1} = \frac{5}{x'+1}$$

$$\begin{aligned} 3x+4y &= 2 \Rightarrow 3x-10y-3x-4y = 2-2 \\ 3x-10y &= 2 \Rightarrow -10y = 2 \Rightarrow y = -\frac{1}{5} \\ 3x &= 2 + \frac{2}{5} = \frac{12}{5} \Rightarrow x = \frac{4}{5} \end{aligned} \quad \text{الف) } \boxed{y = -\frac{1}{5}}, \boxed{x = \frac{4}{5}}$$

$$y = \frac{2-2}{-10-4} = \boxed{-\frac{1}{14}}$$

$$x = -\frac{4+10}{-10-4} = \boxed{\frac{14}{14}} = \boxed{1}$$