

الف) $m_{x+h} \rightarrow \frac{\Delta y}{\Delta x} = m \Rightarrow \frac{2 - (-2)}{4 - 0} = -4$
 $\rightarrow y = -4(x) + h \rightarrow h = 1 \Rightarrow y = -4x + 1$ ✓

ب) $2y + 4x = -1 \quad m = \frac{-2}{4} = -\frac{1}{2} \rightarrow y = -\frac{1}{2}x + h$
 $\rightarrow y = -\frac{1}{2}(4) + h \rightarrow h = 1 \Rightarrow y = -\frac{1}{2}x + 1$ ✓

ج) $x + 3y = 1 \rightarrow m_1 = \frac{-1}{3} \quad m_2 = 3 \rightarrow y = 3x + h$
 $y = 3(4) + h \rightarrow h = -10 \Rightarrow y = 3x - 10$ ✓

د) $\tan \frac{\pi}{4} = m = \sqrt{3} \rightarrow y = \sqrt{3}x + h$
 $y = \sqrt{3}(4) + h \rightarrow h = 2 - 4\sqrt{3}$
 $y = \sqrt{3}x + 2 - 4\sqrt{3}$ ✓

الف) $\left| \frac{2}{3} \right| \left| \frac{-1}{4} \right|$

$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \Rightarrow \sqrt{9 + 16} = 5$ ✓

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

$\frac{ax + by + c}{\sqrt{a^2 + b^2}} = \frac{(2 \times 3) + (4 \times 3) - 3}{5} = 3$ ✓

الف) $2x + 3y = 4 \rightarrow 4x + 6y = 8$
 $4x + 6y = 1$
 $m = \frac{-4}{6} \quad c = -10 \rightarrow \frac{c_1 + c_2}{2} = \frac{-1 - 10}{2} = -10$
 $\rightarrow 4x + 6y = 10 \rightarrow 2x + 3y = 5$ ✓

$\frac{c - c'}{\sqrt{a^2 + b^2}} = \frac{4}{\sqrt{16 + 36}} = \frac{2}{\sqrt{10}} = \frac{2\sqrt{10}}{10}$ ✓

$\frac{ax_1 + by_1 + c_1}{\sqrt{a^2 + b^2}} = \frac{ax_2 + by_2 + c_2}{\sqrt{a^2 + b^2}} \Rightarrow$

$\frac{|3x - 2y - 1|}{\sqrt{9 + 4}} = \frac{|2x + 3y - 3|}{\sqrt{9 + 4}}$

$3x - 2y - 1 = 2x + 3y - 3 \rightarrow x - 5y = -2 \rightarrow x - 5y + 2 = 0$ ✓

$3x - 2y - 1 = -2x - 3y + 3 \rightarrow 5x + y = 4 \rightarrow 5x + y - 4 = 0$ ✓

$m = \tan \theta = \left| \frac{m - m'}{1 - mm'} \right| = \left| \frac{0}{-1} \right| = 1 \Rightarrow \tan \theta = 1$
 $\theta = 45^\circ = \frac{\pi}{4}$ ✓

$y = 2x = 0 \quad m = 2$

$y + 3x = 3 \quad m' = -\frac{1}{3}$

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{100} = 10 \quad \checkmark$$

$$\begin{cases} \frac{x_1 + x_2}{2} \Rightarrow -1 \\ \frac{y_1 + y_2}{2} \Rightarrow 1 \end{cases} \Rightarrow M = \begin{pmatrix} -1 \\ 1 \end{pmatrix} \quad \checkmark$$

مقل

$$\begin{cases} \frac{x_1 + x_2 + x_3}{3} \Rightarrow \frac{3 - 10 - 2}{3} = -3 \\ \frac{y_1 + y_2 + y_3}{3} \Rightarrow \frac{1 + 2 - 13}{3} = -3 \end{cases} \Rightarrow M = \begin{pmatrix} -3 \\ -3 \end{pmatrix} \quad \checkmark$$

$$S = \frac{1}{4} \begin{vmatrix} -10 & -13 \\ -2 & 3 \\ 3 & 1 \end{vmatrix} = \frac{1}{4} (1 - 11 - 20) = -5 \quad \checkmark$$

$$\text{ا) } y = \frac{2x+1}{5x-3} \Rightarrow -y = \frac{2x+1}{5x-3} \quad \checkmark$$

$$\Rightarrow y = \frac{-2x-1}{5x-3} \quad \checkmark \quad (y \Rightarrow -y)$$

$$\text{ب) } y = \frac{2x+1}{-5x-3} \Rightarrow y = \frac{-2x-1}{-5x-3} \quad \checkmark$$

$$(x \Rightarrow -x)$$

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

$$(x \Rightarrow y, y \Rightarrow x)$$

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

$$(x \Rightarrow -y, y \Rightarrow -x)$$

$$x' = x - 2 \Rightarrow x = x' + 2$$

$$y' = y + 3 \Rightarrow y = y' - 3$$

$$y' - 3 = \frac{2(x' + 2) + 1}{x' + 2 - 3} \Rightarrow y' = \frac{2x' + 5}{x' - 1} \quad \checkmark$$

$$x' = x - 2 \Rightarrow x = x' + 2$$

$$y' = y - 2 \Rightarrow y = y' + 2$$

$$\Rightarrow y' + 2 = \frac{2(x' + 2) + 1}{x' + 2 - 2} \Rightarrow y' = \frac{5}{x'} \quad \checkmark$$

$$\begin{cases} 3x + 4y = 2 \\ 3x - 10y = 5 \end{cases} \xrightarrow{\times 3} \begin{cases} 3x + 4y = 2 \\ 9x - 30y = 15 \end{cases} \Rightarrow 19y = -1 \Rightarrow y = -\frac{1}{19} \quad \checkmark$$

$$x = \frac{15}{19} \quad \checkmark$$

$$x = \frac{\begin{vmatrix} 1 & 4 \\ -10 & 1 \end{vmatrix}}{\begin{vmatrix} 3 & 4 \\ 3 & -10 \end{vmatrix}} = \frac{-14}{-19} = \frac{14}{19} \quad \checkmark$$

$$y = \frac{\begin{vmatrix} 3 & 2 \\ 3 & 5 \end{vmatrix}}{\begin{vmatrix} 3 & 4 \\ 3 & -10 \end{vmatrix}} = \frac{-1}{19} \quad \checkmark$$