

الف) $y = mx + h \rightarrow \frac{\Delta y}{\Delta x} = m \rightarrow \frac{2 - (-2)}{1 - 0} = -4 \xrightarrow{\text{از (۱) استفاده}} y = -4(x) + h \rightarrow h = 11$
 $2y + 4x = -1 \xrightarrow{\text{از (۱) استفاده}} m = \frac{-4}{2} = -2 \rightarrow y = -2x + h \rightarrow y = -2(1) + h \rightarrow h = 14$
 $x + 3y = 1 \xrightarrow{\text{از (۱) استفاده}} m = \frac{-1}{3} \rightarrow m = 3 \rightarrow y = 3x + h \xrightarrow{\text{از (۱) استفاده}} y = 3(1) + h \rightarrow h = -1$
 $\tan \frac{\pi}{4} = m = \sqrt{3} \rightarrow y = \sqrt{3}x + h \xrightarrow{\text{از (۱) استفاده}} y = \sqrt{3}(1) + h \rightarrow h = 2 - \sqrt{3}$

ب) فاصله $\left| \frac{2}{\sqrt{3}} \right|$ ، $\left| \frac{-1}{\sqrt{3}} \right| \rightarrow \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{9 + 12} = 5$

ج) فاصله $\left| \frac{2}{\sqrt{3}} \right|$ ، $3x + 4y = 3 \xrightarrow{\text{از (۱) استفاده}} \frac{ax + by + c}{\sqrt{a^2 + b^2}} = \frac{2 \times 2 + 4 \times 3 - 3}{5} = \frac{14}{5} = 2.8$

د) $2x + 4y = 1 \rightarrow 2x + 4y = 11$ ، $m = \frac{-2}{4} = -\frac{1}{2}$ ، $C = -10 \leftarrow \frac{C_1 + C_2}{2} = \frac{-1 - 11}{2} = -6$
 $2x + 4y = 1$ ، $2x + 4y = 11$
 $\rightarrow 2x + 4y = 10 \rightarrow 2x + 4y = 10$
 $\frac{C - C'}{\sqrt{a^2 + b^2}} = \frac{11 - 1}{\sqrt{2^2 + 4^2}} = \frac{10}{\sqrt{20}} = \frac{10 \sqrt{5}}{2\sqrt{5}} = \frac{5\sqrt{5}}{\sqrt{5}} = 5$

ه) $\frac{ax_1 + by_1 + c_1}{\sqrt{a^2 + b^2}} = \frac{ax_2 + by_2 + c_2}{\sqrt{a^2 + b^2}} \quad \frac{|2x - 4y - 1|}{\sqrt{2^2 + 4^2}} = \frac{|2x + 4y - 3|}{\sqrt{2^2 + 4^2}}$
 $2x - 4y - 1 = 2x + 4y - 3 \rightarrow x - 4y = -2 \rightarrow x + 4y + 2 = 0$
 $2x - 4y - 1 = -2x - 4y + 3 \rightarrow 4x = 4 \rightarrow x = 1$

و) $m = \tan \alpha = \left| \frac{m - m'}{1 + mm'} \right| = \left| \frac{1}{-1} \right| = 1 \rightarrow \tan \alpha = 1$
 $y = 2x = 4 \quad m = 2$
 $y + 3x = 4 \quad m' = -\frac{1}{3}$
 $\alpha = 45^\circ$

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{4^2 + 3^2} = \boxed{5}$$

الف

$$\begin{cases} \frac{x+2y}{3} & \frac{y-1}{2} = -1 \\ \frac{y+2x}{3} & \frac{x-2}{2} = 1 \end{cases} \quad m > n = \begin{vmatrix} -1 & 1 \\ 1 & 1 \end{vmatrix} = \boxed{(-1, 1)}$$

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$$\text{نظم ثلاثي} \begin{cases} \frac{x_1 + x_2 + x_3}{3} & \frac{y - 10 - y}{3} = -3 \\ \frac{y_1 + y_2 + y_3}{3} & \frac{1 + 3 - 13}{3} = -3 \end{cases} \quad m = \begin{vmatrix} -3 & -3 \\ -3 & -3 \end{vmatrix} = \boxed{(-3, -3)}$$

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$$S = \frac{1}{3} \begin{vmatrix} -10 & -13 & 1 \\ -3 & 3 & 1 \\ 3 & 1 & 1 \end{vmatrix} = \frac{1}{3} \times (1 - 11 + 24) = \boxed{4}$$

$$y = \frac{2m+1}{3m-2} \xrightarrow{\text{عوض في } y=-x} -y = \frac{2m+1}{3m-2} \Rightarrow y = \boxed{\frac{-2m-1}{3m-2}} \quad (\text{الف})$$

الف

$$\xrightarrow{\text{عوض في } x=-y} y = \boxed{\frac{-2m+1}{-3m-2}} \quad (\text{ب}) \quad \xrightarrow{\text{عوض في } x=y} x = \frac{y+1}{3y-2} \Rightarrow y = \boxed{\frac{3m+1}{3m-2}} \quad (\text{ج})$$

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$$\xrightarrow{\text{عوض في } x=-y} -x = \frac{-2y+1}{-3y-2} \Rightarrow y = \boxed{\frac{-3m+1}{3m+2}} \quad (\text{د})$$

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

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

$$3x+5y=2 \quad x-ay=1 \xrightarrow{\times 3} 3x-1ay=3$$

$$3x-1ay=3$$

$$19y=-1 \quad \boxed{y = -\frac{1}{19}} \quad \boxed{x = \frac{19}{19}}$$

$$x = \frac{\begin{vmatrix} 3 & 2 \\ -a & 1 \end{vmatrix}}{\begin{vmatrix} 3 & 5 \\ 1 & -a \end{vmatrix}} = \frac{-10}{-19} = \frac{10}{19}$$

$$y = \frac{\begin{vmatrix} 3 & 2 \\ 1 & 1 \end{vmatrix}}{\begin{vmatrix} 3 & 5 \\ 1 & -a \end{vmatrix}} = -\frac{1}{19}$$

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