

$$a = \frac{2-2}{5-1} = \frac{-1}{4} \quad y = -\frac{1}{4}x + b \xrightarrow{\left| \frac{-1}{4} \right|} -2 = -\frac{1}{4} + b \Rightarrow b = -\frac{7}{4} \quad \boxed{y = -\frac{1}{4}x - \frac{7}{4}} \quad (1 \text{ الف})$$

$$2y + 2x + 1 \rightarrow y = -\frac{1}{2}x - \frac{1}{2} \xrightarrow{a = -\frac{1}{2}} b = -\frac{1}{2} \quad y = -\frac{1}{2}x + b \xrightarrow{\left| \frac{-1}{2} \right|} 2 = -\frac{1}{2} + b \xrightarrow{b = \frac{5}{2}} \boxed{y = -\frac{1}{2}x + \frac{5}{2}} \quad (2 \text{ الف})$$

$$y = -\frac{1}{4}x + 1 \xrightarrow{a = -\frac{1}{4}} y = \frac{1}{2}x + b \xrightarrow{\left| \frac{1}{2} \right|} 2 = \frac{1}{2} + b \xrightarrow{b = \frac{3}{2}} \boxed{y = \frac{1}{2}x + \frac{3}{2}} \quad (2 \text{ ب})$$

$$\frac{1}{r} = \frac{1}{\sqrt{2}} \Rightarrow \tan \theta = \frac{1}{\sqrt{2}} \Rightarrow \sqrt{2} = a \Rightarrow y = \sqrt{2}x + b \xrightarrow{\left| \frac{1}{\sqrt{2}} \right|} 2 = \frac{1}{\sqrt{2}} + b \xrightarrow{b = \frac{3}{\sqrt{2}}} \boxed{y = \sqrt{2}x + \frac{3}{\sqrt{2}}} \quad (3 \text{ الف})$$

$$\sqrt{(2-2)^2 + (-1-2)^2} = \sqrt{16+9} = \sqrt{25} = 5$$

۲ الف

$$\frac{|2x + (y-3)|}{\sqrt{4+1}} = \frac{|4+12-3|}{5} = \frac{15}{5} = 3$$

(ب)

$$f(x) = y = 1 \Rightarrow x + y = 1$$

$$x + y = \frac{1+1}{2} \Rightarrow \boxed{x + y = 1}$$

۳ الف

$$\frac{|c-c'|}{\sqrt{a^2+b^2}} = \frac{|1-2|}{\sqrt{4+9}} = \frac{1}{\sqrt{13}}$$

(ب)

$$\frac{|x_1 - y_1|}{\sqrt{9+4}} = \frac{|x_2 + y_2 - 3|}{\sqrt{9+4}} = \frac{x_2 - y_2 - 1}{\sqrt{13}} = \pm \frac{x_2 + y_2 - 3}{\sqrt{13}}$$

$$\Rightarrow x_1 - y_1 - 1 = x_2 + y_2 - 3 \Rightarrow \boxed{x - y + 2 = 0}$$

$$\Rightarrow x_1 - y_1 - 1 = -x_2 - y_2 + 3 \Rightarrow \boxed{2x + y - 4 = 0}$$

$$y = -\frac{1}{2}x + 2, \quad y = \frac{1}{2}x + 5$$

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

$$m = \frac{1}{2}$$

$$\tan \alpha = \left| \frac{2 - (-2)}{1 + 2(-2)} \right| = \left| \frac{4}{-3} \right| = 1 \Rightarrow \boxed{\alpha = \frac{\pi}{4} = 45^\circ}$$

۵

$$\sqrt{(-2-1)^2 + (2-5)^2} = \sqrt{9+9} = \sqrt{18} = 3\sqrt{2}$$

۶ الف

$$\frac{-2 + \frac{1}{2}}{r} = 1 \Rightarrow y = \frac{2-1}{r} = -1 \Rightarrow \boxed{(-1, 1)}$$

(ب)

$$x_G = \frac{3-2-1}{3} = 0$$

$$y_G = \frac{-1+2+1}{3} = \frac{2}{3} \quad (-\frac{2}{3}, -\frac{1}{3})$$

۷ الف

$$\frac{1}{r} \begin{vmatrix} -1 & -1 & 1 \\ -2 & 2 & 1 \\ 3 & 1 & 1 \end{vmatrix} \Rightarrow \frac{1}{r} (-1 + 2 - 3) = \frac{1}{r} (-2) = \frac{1}{r} \Rightarrow \boxed{r = -2}$$

(ب)

$$y = \frac{-r_n + 1}{-f_n - r}$$

(-)

$$-y = \frac{r_n + 1}{f_n - r}$$

(2) - 1

$$-n = \frac{-r_y + 1}{-f_y - r} \Rightarrow -f_n y + r_n = -r_y + 1 \quad (-)$$

$$-f_n y + r_y = 1 - r_n$$

$$y(-f_n + r) = 1 - r_n \Rightarrow \boxed{y = \frac{1 - r_n}{-f_n + r}}$$

$$n = \frac{r_y + 1}{f_y - r} \Rightarrow f_y n - r_n = r_y + 1 \quad (2)$$

$$f_y n - r_y = r_n + 1$$

$$y(f_n - r) = r_n + 1 \Rightarrow \boxed{y = \frac{r_n + 1}{f_n - r}}$$

$$\left. \begin{array}{l} y' = y + r \rightarrow y = y' - r \\ n' = n - r \rightarrow n = n' + r \end{array} \right\} y' - r = \frac{r(n' + r) + 1}{n' + r - r} = y' = \frac{r n' + r^2 + 1}{n' - 1} + r = y' = \frac{r n' + r^2 + 1 + r n' - r}{n' - 1} \quad (9) \text{ (نقطة)}$$

$$\Rightarrow y' = \frac{2r n' + r^2 + 1}{n' - 1}$$

$$\left. \begin{array}{l} y' = y - r \rightarrow y = y' + r \\ n' = n - r \rightarrow n = n' + r \end{array} \right\} y' + r = \frac{r(n' + r) + 1}{n' + r - r} = y' = \frac{r n' + r^2 + 1}{n' - 1} - r = y' = \frac{r n' + r^2 + 1 - r n' + r}{n' - 1} \quad (-)$$

$$\Rightarrow \boxed{y' = \frac{r^2 + 1}{n' - 1}}$$

$$\left. \begin{array}{l} r_n + f_y = r \\ n - a_y = 1 \end{array} \right\} \Rightarrow \left. \begin{array}{l} r_n + f_y = r \\ -r_n + 1 a_y = -r \end{array} \right\} \Rightarrow \begin{array}{l} 19y = -1 \Rightarrow y = -\frac{1}{19} \\ n = \frac{18}{19} \end{array}$$

(10) الف

$$n = -\frac{\begin{vmatrix} b & c \\ b' & c' \end{vmatrix}}{\begin{vmatrix} a & b \\ a' & b' \end{vmatrix}}} = -\frac{\begin{vmatrix} 1 & 2 \\ -5 & 1 \end{vmatrix}}{\begin{vmatrix} 2 & 1 \\ 1 & -5 \end{vmatrix}}} = -\frac{1 \cdot 1 - 2 \cdot (-5)}{2 \cdot (-5) - 1 \cdot 1} = \frac{11}{-11} = -1$$

$$y = \frac{\begin{vmatrix} a & c \\ a' & c' \end{vmatrix}}{\begin{vmatrix} a' & b \\ a' & b' \end{vmatrix}}} = \frac{\begin{vmatrix} 3 & 2 \\ 1 & 1 \end{vmatrix}}{\begin{vmatrix} 2 & 1 \\ 1 & -5 \end{vmatrix}}} = \frac{3 \cdot 1 - 2 \cdot 1}{2 \cdot (-5) - 1 \cdot 1} = \frac{1}{-11} = -\frac{1}{11}$$