

$$1) \quad a(4, 2) \quad b(1, -2) \quad -2 \times 4 - 1 \times (-2) = -8$$

$$m = \frac{2 - (-2)}{4 - 1} = -\frac{4}{3} \Rightarrow y = mx + b = -\frac{4}{3}x + b \Rightarrow y = -\frac{4}{3}x + 18 \quad \checkmark$$

$$2) \quad y = -\frac{4}{3}x + 1 \Rightarrow m = -\frac{4}{3} \Rightarrow y = -\frac{4}{3}x + b \Rightarrow y = -\frac{4}{3}x + 14 \quad \checkmark$$

$$2 = -\frac{4}{3} \times 1 + b \Rightarrow b = 14$$

$$3) \quad x + 2y = 1 \quad m = -\frac{1}{2} \Rightarrow m' = 2 \quad y = 2x + b \Rightarrow y = 2x - 10 \quad \checkmark$$

$$\frac{\pi}{2} = 90^\circ \quad 2 = 2 \times 1 + b \Rightarrow b = -10$$

$$4) \quad \angle \alpha \quad m = \tan 45^\circ = 1 \quad y = 1x + b \Rightarrow y = \sqrt{2}x - (\sqrt{2} + 2) \quad \checkmark$$

$$2 = 1 \times \sqrt{2} + b \Rightarrow b = -(\sqrt{2} + 2)$$

$$A(-2, 2) \quad B(-1, 7) \quad V(-2, -1)$$

$$1) \quad AB = \sqrt{(5)^2 + (5)^2} = \sqrt{50} = 5\sqrt{2} \quad \checkmark$$

$$2) \quad c = 2x + 4y - 3 = 0 \quad Ac = \frac{|2x + 4y - 3|}{\sqrt{2^2 + 4^2}} = \frac{4 \times 12 - 3}{5} = 9 \quad \checkmark$$

$$2x + 4y = 18 \quad 2x + 4y = 7 \Rightarrow 2x + 4y = 12$$

$$1) \quad mx + by = \frac{c + c'}{r} \Rightarrow 2x + 4y = \frac{18 + 7}{2} = \frac{25}{2} \Rightarrow 2x + 4y = 12.5 \quad \checkmark$$

$$\Rightarrow d = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{|18 - 7|}{\sqrt{2^2 + 4^2}} = \frac{11}{\sqrt{20}} = \frac{11}{2\sqrt{5}} \quad \checkmark$$

$$\frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|ax' + by' + c'|}{\sqrt{(a')^2 + (b')^2}} \Rightarrow \frac{|2x - 4y - 1|}{\sqrt{2^2 + 4^2}} = \frac{|2x + 4y - 3|}{\sqrt{2^2 + 4^2}}$$

$$\Rightarrow |2x - 4y - 1| = |2x + 4y - 3|$$

$$1) \quad 2x - 4y - 1 = 2x + 4y - 3 \Rightarrow x - 4y + 1 = 0 \quad \checkmark$$

$$2) \quad 2x - 4y - 1 = -(2x + 4y - 3) \Rightarrow 4x + 4y - 4 = 0 \Rightarrow x + y - 1 = 0 \quad \checkmark$$

$$1) \quad y - 2x = 1 \Rightarrow m_1 = -2$$

$$2) \quad y + 2x = 1 \Rightarrow m_2 = -\frac{1}{2}$$

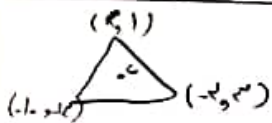
$$\tan \alpha = \left| \frac{m - m'}{1 + mm'} \right| = \left| \frac{-2 - (-\frac{1}{2})}{1 - 1} \right| = \frac{1}{0} = \infty \Rightarrow \alpha = \frac{\pi}{2} \quad \checkmark$$

$$A(2, -2) \quad B(-5, 4)$$

(2) -9

$$الف) = |AB| = \sqrt{(2 - (-5))^2 + (-2 - 4)^2} = \sqrt{9 + 36} = \sqrt{45} = 3\sqrt{5}$$

$$ب) \frac{(2, -2)}{\left(\frac{2-5}{3}, \frac{-2-4}{3}\right)} = \frac{(2, -2)}{(-1, -2)} \Rightarrow \frac{2-5}{3} = -1, \frac{-2-4}{3} = -2 \Rightarrow (-1, -2)$$



$$x_G = \frac{x_1 + x_2 + x_3}{3} = \frac{2 - 5 + 1}{3} = -\frac{2}{3}$$

$$y_G = \frac{y_1 + y_2 + y_3}{3} = \frac{-2 + 4 + 1}{3} = \frac{3}{3} = 1$$

$$\Rightarrow (-\frac{2}{3}, 1) \quad (الف) (2) -17$$

$$ب) S = \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = \frac{1}{2} \begin{vmatrix} 2 & -2 & 1 \\ -5 & 4 & 1 \\ 1 & 1 & 1 \end{vmatrix} = \frac{1}{2} (2 + 24 - 1 - (-20 - 29 - 2)) = \frac{1}{2} (24 + 51) = \frac{75}{2} = 37.5$$

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

-8

(2)

$$الف) = -y = \frac{x+1}{x-2}$$

$$2) x = \frac{y+1}{y-2} \Rightarrow xy - 2x = y + 1$$

$$-x - 1 = y - 2x$$

$$-x - 1 = y(1 - 2x)$$

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

$$ب) y = \frac{-x-1}{-2x-1}$$

$$د) -x = \frac{-y+1}{-y-2} \Rightarrow xy + x = -y + 1$$

$$x - 1 = -y(1 + 2x) \Rightarrow -x = \frac{x-1}{1+2x}$$

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

$$x' = x - a$$

$$y' = y - b$$

(2) -9

$$الف) x = x' + 2$$

$$y = y' - 3$$

$$y' = \frac{x'(x'+2)+1}{(x'+2)-2} = \frac{x'(x'+2)+1}{x'}$$

$$y' = \frac{x'^2 + 2x' + 1}{x' - 1} = y' = \frac{x'^2 + 2x' + 1}{x' - 1}$$

$$ب) x = x' + 2$$

$$y = y' + 2$$

$$y' + 2 = \frac{x'(x'+2)+1}{(x'+2)-2} = \frac{x'(x'+2)+1}{x'}$$

$$y' = \frac{x'^2 + 2x' + 1}{x'} - 2 = y' = \frac{x'^2 + 2x' + 1 - 2x'}{x'} = \frac{x'^2 + 1}{x'}$$

$$\begin{cases} 2x + 4y = 2 \\ x - 5y = 1 \end{cases}$$

$$\Rightarrow 4y + 10y = -1 \quad 14y = -1 \quad y = -\frac{1}{14} \quad x = \frac{18}{14}$$

(الف) (2) -1

$$\begin{cases} 2x + 4y = 2 \\ x - 5y = 1 \end{cases}$$

$$x = -\frac{\begin{vmatrix} 2 & 4 \\ 1 & -5 \end{vmatrix}}{\begin{vmatrix} 2 & 4 \\ 1 & -5 \end{vmatrix}} = -\frac{18}{-14} = \frac{9}{7}$$

$$y = \frac{\begin{vmatrix} 2 & 2 \\ 1 & -1 \end{vmatrix}}{\begin{vmatrix} 2 & 4 \\ 1 & -5 \end{vmatrix}} = \frac{1}{-14} = -\frac{1}{14}$$