

۱- الف) $A(4, 2)$ و $B(2, -2)$ $-2 \times 4 - 1 \times 2 = -10$

$$m = \frac{2 - (-2)}{4 - 2} = 2 \Rightarrow y = mx + b = 2x + b \Rightarrow y = 2x + 10$$

ب) $2y = -x + 1 \Rightarrow m = -\frac{1}{2} \Rightarrow y = -\frac{1}{2}x + b$
 $2 = -\frac{1}{2} \times 4 + b \Rightarrow b = 3$
 $y = -\frac{1}{2}x + 3$

ج) $x + 2y = 1 \Rightarrow m = -\frac{1}{2} \Rightarrow y = -\frac{1}{2}x + b$
 $1 = -\frac{1}{2} \times 2 + b \Rightarrow b = 2$
 $y = -\frac{1}{2}x + 2$

د) $\angle C = 45^\circ$
 $m = \tan 45^\circ = 1 \Rightarrow y = x + b \Rightarrow y = x - 3$
 $3 = 1 \times 4 + b \Rightarrow b = -1$

۲- الف) $A(2, 2)$ و $B(-1, 5)$ $5 - 2 = 3$

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

ب) $C(2, 2)$ و $A(2, 2)$ $AC = \frac{|2 \times 2 + 2 \times 2 - 3|}{\sqrt{2^2 + 2^2}} = \frac{3}{\sqrt{8}} = \frac{3\sqrt{2}}{4}$

۳- $x + y = 1$ و $x + 2y = 3 \Rightarrow x + y = 1$

الف) $mx + by = \frac{c+c'}{2} \Rightarrow x + y = \frac{1+3}{2} = 2 \Rightarrow x + y = 2$

ب) $d = \frac{|c-c'|}{\sqrt{a^2+b^2}} = \frac{|1-3|}{\sqrt{1^2+1^2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$

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

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

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

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

۵- ① $y-x=2 \Rightarrow m_1 = -1$

② $y+x=2 \Rightarrow m_2 = -1$

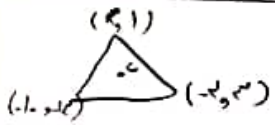
$\tan \alpha = \left| \frac{m-m'}{1+mm'} \right| = \left| \frac{-1-(-1)}{1+(-1)(-1)} \right| = \frac{0}{2} = 0 \Rightarrow \alpha = \frac{\pi}{2}$

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

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

$$ب) \begin{matrix} (2, -2) & & (-5, 4) \\ \downarrow & & \downarrow \\ (\frac{2+(-5)}{2}, \frac{-2+4}{2}) \end{matrix} \Rightarrow \frac{2-5}{2} = -1, \frac{-2+4}{2} = 1 \Rightarrow (-1, 1)$$



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

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

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

-V

$$ب) S = \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = \frac{1}{2} \begin{vmatrix} 2 & -2 & 1 \\ -5 & 4 & 1 \\ 1 & 1 & 1 \end{vmatrix} = \frac{1}{2} (2 + 24 - 1 - (-20 - 29 - 2)) = \frac{1}{2} (26 + 51) = \frac{77}{2}$$

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

-A

$$الف) = -y = \frac{x+1}{x-2}$$

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

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

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

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

$$ب) y = \frac{-x+1}{-x-2}$$

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

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

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

$$x' = x - a$$

$$y' = y - b$$

-9

$$الف) \begin{matrix} x = x' + 2 \\ y = y' - 3 \end{matrix} \quad y' = \frac{x'(x'+2)+1}{(x'+2)-2} = y' = \frac{x'^2+2x'+1}{x'} = y' = \frac{x'^2+2x'+1}{x'}$$

$$ب) \begin{matrix} x = x' + 2 \\ y = y' + 2 \end{matrix} \quad y' + 2 = \frac{x'(x'+2)+1}{(x'+2)-2} = y' = \frac{x'^2+2x'+1}{x'}$$

$$\begin{cases} 2x + 4y = 2 \\ x - 5y = 1 \end{cases} \Rightarrow \begin{matrix} 2x + 10y = -1 \\ 19y = -1 \\ y = -\frac{1}{19} \end{matrix} \quad x = \frac{18}{19} \quad (الف)$$

-1.

$$\begin{cases} 2x + 4y = 2 \\ x - 5y = 1 \end{cases} \quad x = -\frac{\begin{vmatrix} 2 & 1 \\ -5 & -1 \end{vmatrix}}{\begin{vmatrix} 2 & 4 \\ 1 & -5 \end{vmatrix}} = -\frac{18}{-19} = \frac{18}{19} \quad y = \frac{\begin{vmatrix} 2 & 2 \\ 1 & -5 \end{vmatrix}}{\begin{vmatrix} 2 & 4 \\ 1 & -5 \end{vmatrix}} = \frac{-12}{-19} = \frac{12}{19} \quad (ب)$$