

الف) $m = \frac{-4}{1} = -4 \rightarrow y - 2 = -4(x - 4) \rightarrow y = -4x + 18$

ب) $m = \frac{-6}{3} = -2 \rightarrow y - 2 = -2(x - 4) \rightarrow y = -2x + 10$

ج) $m = \frac{-1}{3} \rightarrow m' = 3 \rightarrow y - 2 = 3(x - 4) \rightarrow y = 3x - 10$

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

الف) $\sqrt{\Delta x^2 + \Delta y^2} = \sqrt{3^2 + 4^2} = 5$

ب) $\frac{|3x + 4y - 3|}{\sqrt{4 + 14}} \xrightarrow{x=2, y=3} \frac{|6 + 12 - 3|}{5} = \frac{15}{5} = 3$

$\frac{4}{3} = \frac{4}{3} \neq \frac{1}{3} \rightarrow$ دو خط موازی و غیر منطبق می‌باشند $4x + 9y = 1 \xrightarrow{\times 2} 8x + 18y = 2$

الف) $ax + by = \frac{c+c'}{2} \Rightarrow 4x + 3y = \frac{4+4}{2} \Rightarrow 4x + 3y = 4 \rightarrow y = \frac{-4x + 4}{3}$

ب) $\frac{|c - c'|}{\sqrt{a^2 + b^2}} \rightarrow \frac{|4 - 4|}{\sqrt{4^2 + 3^2}} = \frac{0}{5} = \frac{0 \cdot \sqrt{13}}{13}$

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

$3x - 2y - 1 = 4x + 3y - 3 \rightarrow -x - 5y = -2 \rightarrow y = \frac{x + 2}{5}$
 $3x - 2y - 1 = -(4x + 3y - 3) \rightarrow 3x - 2y - 1 = -4x - 3y + 3 \rightarrow 7x - y = 4 \rightarrow y = -7x + 4$

~~موازی~~ $m = 2, m' = -3$

$\tan \alpha = \left| \frac{m - m'}{1 + mm'} \right| \rightarrow \tan \alpha = \left| \frac{5}{-5} \right| = 1 \Rightarrow \alpha = \frac{\pi}{4} = 45^\circ$

زاویه منفرجه $= 180 - 45 = 135^\circ$

الف) $\sqrt{\Delta x^2 + \Delta y^2} = \sqrt{9 + 16} = 5$

ب) $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \Rightarrow \left(\frac{-2}{2}, \frac{2}{2} \right) = (-1, 1)$

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الف) $\left(\frac{-10 - 2 + 3}{3}, \frac{-13 + 3 + 1}{3} \right) = (-3, -3)$

ب) $\frac{1}{3} \begin{vmatrix} -10 & -2 & 3 \\ -13 & 3 & 1 \\ 1 & 1 & 1 \end{vmatrix} = \frac{-96}{3} = -32$

٧

الف) $-y = \frac{2x+1}{2x-3} \rightarrow y = \frac{2x+1}{3-2x}$

ب) $y = \frac{-2x+1}{-2x-3} \rightarrow y = \frac{2x-1}{2x+3}$

ج) $x = \frac{2y+1}{2y-3} \rightarrow y = \frac{2x+1}{2x-3}$

د) $-x = \frac{-2y+1}{-2y-3} \rightarrow y = \frac{1-2x}{2x+3}$

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الف) $x' = x - 2 \rightarrow x = x' + 2$
 $y' = y + 3 \rightarrow y = y' - 3$
 $\Rightarrow y' - 3 = \frac{2x' + 2}{x' - 1} \rightarrow y' = \frac{2x' + 2}{x' - 1} + 3$

ب) $x' = x - 3 \rightarrow x = x' + 3, y' = y - 2 \rightarrow y = y' + 2$
 $\rightarrow y' = \frac{2x' + 2}{x' - 1}$

$y + 2 = \frac{2x' + 3}{x' - 1} \rightarrow y' = \frac{2x' + 3}{x' - 1} - 2 \rightarrow y' = \frac{2x' + 3 - 2x' + 2}{x' - 1} \rightarrow y' = \frac{5}{x' - 1}$

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الف) $\begin{cases} 2x + 3y = 2 \\ x - 2y = 1 \end{cases} \xrightarrow{\times(-2)} \begin{cases} 2x + 3y = 2 \\ -2x + 4y = -2 \end{cases} \rightarrow 7y = 0 \rightarrow y = 0, x = \frac{1}{2}$

ب) $x = -\frac{\begin{vmatrix} 2 & 3 \\ -2 & 4 \end{vmatrix}}{\begin{vmatrix} 2 & 3 \\ 1 & -2 \end{vmatrix}} = -\frac{14}{-7} = 2, y = \frac{\begin{vmatrix} 2 & 2 \\ 1 & -2 \end{vmatrix}}{\begin{vmatrix} 2 & 3 \\ 1 & -2 \end{vmatrix}} = \frac{-6}{-7} = \frac{6}{7}$

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