

الف) $m = \frac{y-(-2)}{x-5} = -2 \rightarrow y+2 = -2(x-5) \rightarrow y = -2x+10$ ✓ (1)

ب) $\frac{y-2}{x-4} = \frac{-6}{5} = -\frac{6}{5} \rightarrow y-2 = -\frac{6}{5}(x-4) \rightarrow y = -\frac{6}{5}x + \frac{14}{5}$ ✓ (2)

ج) $\frac{-1}{3} = m_1 \rightarrow m_2 = 3 \rightarrow y-2 = 3(x-4) \rightarrow y = 3x-10$ ✓

د) $\tan \alpha = m \rightarrow \tan \frac{\pi}{3} = \sqrt{3}$

$\hookrightarrow y-2 = \sqrt{3}(x-4)$ ✓

$\hookrightarrow y = \frac{1}{\sqrt{3}}x - \frac{4}{\sqrt{3}} + 2$

الف) $\sqrt{(y-2)^2 + (x-4)^2} = \sqrt{25} = 5$ ✓ ب) $\frac{|6+12-3|}{\sqrt{3^2+4^2}} = \frac{15}{5} = 3$ ✓ $3x+4y-3=0$ (2) (2)

الف) $\begin{cases} 4x+6y=8 \\ 3x+6y=12 \end{cases} \xrightarrow{\text{خارج‌الضرب}} \begin{cases} 4x+6y=8 \\ 4x+6y=12 \end{cases} \rightarrow 4x+6y=10$ ✓ ب) $d = \frac{|12-8|}{\sqrt{4^2+6^2}} = \frac{4}{\sqrt{52}} = \frac{2}{\sqrt{13}}$ ✓ (3) (2)

$\frac{|3x-2y-1|}{\sqrt{3^2+2^2}} = \frac{|2x+3y-3|}{\sqrt{(-2)^2+3^2}} \rightarrow \begin{cases} 3x-2y-1 = 2x+3y-3 \rightarrow x-5y = -2 \\ 3x-2y-1 = -(2x+3y-3) \rightarrow 5x+y = 4 \end{cases}$ ✓ (2) (4)

$m_1 = -3 / m_2 = 2 \rightarrow \tan \alpha = \left| \frac{m_1 - m_2}{1 + m_1 m_2} \right| = \left| \frac{-3-2}{1-6} \right| = \frac{5}{5} = 1 \rightarrow \begin{cases} \alpha_1 = 45^\circ \\ \alpha_2 = 135^\circ \end{cases}$ ✓ (2) (5)

الف) $d = \sqrt{6^2 + 8^2} = \sqrt{100} = 10$ ✓ ب) $c \left| \frac{-\Delta + \Delta}{x+(-r)} \right| \rightarrow c \left| \frac{-1}{1} \right|$ ✓ (2) (4)

الف) $x = \frac{-1-2+3}{3} = -\frac{2}{3} / y = \frac{-13+1+3}{3} = -\frac{9}{3} = -3 \rightarrow M \left| \begin{array}{cc|c} -\frac{2}{3} & -3 & 1 \\ -3 & -9 & 1 \end{array} \right| \rightarrow S = \frac{1}{\frac{1}{3}} \left| \begin{array}{cc|c} -\frac{2}{3} & -3 & 1 \\ -3 & -9 & 1 \end{array} \right| = \frac{1}{\frac{1}{3}} \left| \begin{array}{cc|c} -2 & -9 & 3 \\ -9 & -27 & 3 \end{array} \right| = \frac{1}{\frac{1}{3}} \times 96 = 288$ ✓ (2) (6)

الف) $-y = \frac{2x+1}{4x-3} \rightarrow y = \frac{-2x-1}{4x-3}$ ✓ ب) $y = \frac{-2x+1}{-4x-3}$ ✓ ج) $x = \frac{2y+1}{4y-3} \rightarrow y = \frac{-2x-1}{4x-3} = \frac{2x+1}{4x-3}$ ✓ (1) (2)

د) $4x = \frac{-2y+1}{4y-3} \rightarrow x = \frac{-2y+1}{4y-3} \rightarrow y = \frac{-2x-1}{4x-3} = \frac{2x+1}{4x-3}$ ✓

الف) $\begin{cases} x' = x-2 \rightarrow x = x'+2 \\ y' = y+3 \rightarrow y = y'-3 \end{cases} \rightarrow y'-3 = \frac{2(x'+2)+1}{(x'+2)-3} = \frac{2x'+5}{x'-1} \rightarrow y' = \frac{2x'+5+3x'-3}{x'-1} = \frac{5x'+2}{x'-1}$ ✓ (2) (9)

الف) $\begin{cases} 3x+4y=2 \\ -x(x-5y=1) \\ -3x+15y=-3 \end{cases} \rightarrow 19y = -1 \rightarrow y = \frac{-1}{19}$ ✓ $\rightarrow x = \frac{-5}{19} + 1 = \frac{14}{19}$ ✓

ب) $x = -\frac{\begin{vmatrix} 4 & 2 \\ 3 & -5 \end{vmatrix}}{\begin{vmatrix} 3 & 4 \\ 1 & -5 \end{vmatrix}} = \frac{-(4+10)}{-15-4} = \frac{14}{19}$ ✓

$y = \frac{\begin{vmatrix} 3 & 2 \\ 1 & 1 \end{vmatrix}}{\begin{vmatrix} 3 & 4 \\ 1 & -5 \end{vmatrix}} = \frac{3-2}{-15-4} = \frac{-1}{19}$ ✓

ب) $\begin{cases} x' = x-3, y' = y-2 \\ \rightarrow x = x'+3, y = y'+2 \\ \rightarrow y'+2 = \frac{2(x'+3)+1}{x'+3-3} = \frac{2x'+7}{x'} \\ \rightarrow y' = \frac{2x'+7}{x'} - 2 = \frac{2x'+7-2x'}{x'} = \frac{7}{x'} \\ \rightarrow y' = \frac{7}{x'} \end{cases}$ ✓