

« ابراهيم بن محمد بن اسحاق »

نیا ندرین

از سفر

سوال (۱) الف) $\begin{cases} 4a+b=1 \\ 5a+b=-2 \end{cases} \Rightarrow \begin{cases} -4a-b=-1 \\ 5a+b=2 \end{cases} \Rightarrow \begin{cases} a=0.7 \\ b=2 \end{cases} \Rightarrow y=2$

ب) $y+2+1=0 \Rightarrow m = \frac{-6}{1} = -6 \Rightarrow 4(-3)+b=2 \Rightarrow b=14$

ج) $x+3y-1=0 \Rightarrow m = \frac{-1}{3} \Rightarrow 4(3)+b=2 \Rightarrow b=-10 \Rightarrow y = \frac{1}{3}x - 10$

د) $\theta = 45^\circ \Rightarrow \tan 45^\circ = \sqrt{3} = m \Rightarrow 4(\sqrt{3})+b=2 \Rightarrow b=2-4\sqrt{3}$
 $\Rightarrow y = \sqrt{3}x + 2 - 4\sqrt{3}$

سوال (۲) الف) $d = \sqrt{(1)^2 + (-3)^2} = 5$

ب) $4x+3y-2=0 \Rightarrow d = \frac{|3(1)+4(-3)-2|}{\sqrt{9+16}} = \frac{15}{5} = 3$

سوال (۳) معادله خط را در دو خط موازی قرار دهیم: $4x+3y=5$ و $4x+3y=1$
 تفاوت سمت راست: $4x+3y=5$ و $4x+3y=1$
 $\frac{5-1}{\sqrt{16+9}} = \frac{4}{5}$

ب) $d = \frac{|c-c'|}{\sqrt{a^2+b^2}} = \frac{|5-1|}{\sqrt{(4)^2+(3)^2}} = \frac{4}{5} \times \frac{\sqrt{16+9}}{\sqrt{16+9}} = \frac{4\sqrt{25}}{25}$

سوال (۴) $4x+3y-2=0$ و $4x-2y-1=0$
 $\frac{|a_1x+b_1y+c_1|}{\sqrt{a_1^2+b_1^2}} = \frac{|a_2x+b_2y+c_2|}{\sqrt{a_2^2+b_2^2}} \Rightarrow \frac{4x+3y-2}{\sqrt{16+9}} = \pm \frac{4x-2y-1}{\sqrt{16+4}}$
 $4x+3y-2 = \pm (4x-2y-1) \Rightarrow x-5y+2=0$ و $5x+y-4=0$

$$\begin{aligned} y + r_2 - r_1 &= 0 \quad m_1 = -r_1 \\ y - r_2 - d &= 0 \quad m_2 = r_2 \end{aligned} \quad \tan \theta = \frac{|m_1 - m_2|}{|1 + m_1 m_2|} \Rightarrow \tan \theta = \left| \frac{-r_1 - r_2}{1 - r_1 r_2} \right| \quad (\omega) \text{ سائل}$$

$$\Rightarrow \left| \frac{-\omega}{-\omega} \right| = 1 \quad \tan \theta = 1 \Rightarrow \theta = 45^\circ$$

$A \begin{vmatrix} \mu & \\ & -\nu \end{vmatrix} \quad B \begin{vmatrix} -\nu & \\ & \mu \end{vmatrix} \quad \text{الف) } AB = \sqrt{(\nu)^r + (-\mu)^r} = [1.0]$ سؤال ٤

c) $M: \frac{x_A + 2x_B}{r} = -1, \frac{y_A + y_B}{r} = 1 \rightsquigarrow M: (-1, 1)$



$$A(3, 1)$$

$$M = \left(\frac{3 + (-1) + (-2)}{3}, \frac{1 + (-13) + 1}{3} \right) = (-3, -4)$$

$$\Rightarrow S = \frac{1}{1} \left[\underbrace{1^2(-14)}_{-14} - \underbrace{1 \cdot 0(1)}_{-10} - \underbrace{1(14)}_{-14} \right] = \boxed{18}$$

سؤال ٨) این دستگاه را نسبت به محور x و y حل کنید

الف) $y = \frac{x_2 + 1}{x_2 - 1}$

ب) $y = -\frac{x_2 + 1}{x_2 - 1} \Rightarrow y = \frac{-x_2 - 1}{x_2 - 1}$

ج) $y = \frac{-x_2 + 1}{-x_2 - 1}$

$$\Rightarrow r_2 y - r_1 y = r_2 + 1 \Rightarrow r_2 (r_1 - 1) = r_2 + 1 \Rightarrow r_2 = \frac{r_2 + 1}{r_1 - 1} \Rightarrow y = \frac{r_2 + 1}{r_1 - 1}$$

$$2) \quad \frac{-y-2}{-4y-1} = \frac{-2y+1}{-4y-1} \Rightarrow -x = \frac{-2y+1}{-4y-1} \Rightarrow -x(-4y-1) = -2y+1$$

$$\Rightarrow r_2 y + r_2 = -y + 1 \Rightarrow r_2 y + y = -r_2 + 1 \Rightarrow y(r_2 + 1) = -r_2 + 1$$
$$\Rightarrow y = \frac{-r_2 + 1}{r_2 + 1} \Rightarrow y = \frac{-r_2 + 1}{r_2 + 1}$$

سؤال ٩

$$y = \frac{x+1}{x-1} \quad \text{الف) } \begin{cases} x' = x-1 \\ y' = y+1 \end{cases} \Rightarrow \begin{cases} x = x'+1 \\ y = y'-1 \end{cases}$$

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

$$\Rightarrow y' = \frac{2x'+2}{x'-1} \quad \text{ب) } \begin{cases} x' = x-1 \\ y' = y-1 \end{cases} \Rightarrow \begin{cases} x = x'+1 \\ y = y'+1 \end{cases}$$

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

$$\text{الف) } \begin{cases} 12 + 14y = 1 \\ x - 12y = 1 \end{cases} \Rightarrow \begin{cases} 12x + 14y = 1 \\ -12x + 12y = -1 \end{cases} \Rightarrow \begin{cases} 19y = -1 & y = \frac{-1}{19} \\ x = \frac{14}{19} \end{cases} \quad \text{سؤال ١٠}$$

ب) $\begin{cases} Kx + Ky = r \\ x - dy = 1 \end{cases}$ (1. سوال)

$$x = - \frac{\begin{vmatrix} K & r \\ -d & 1 \end{vmatrix}}{\begin{vmatrix} K & K \\ 1 & -d \end{vmatrix}} = - \frac{K - (-1.0)}{-1d - (K)} = \boxed{\frac{1K}{19}}$$

$$y = \frac{\begin{vmatrix} K & r \\ 1 & 1 \end{vmatrix}}{\begin{vmatrix} K & K \\ 1 & -d \end{vmatrix}} = \frac{K - r}{-1d - K} = \boxed{\frac{-1}{19}}$$