

نام خانوادگی: زهرا دات عزیز / شماره ثبت: ۱۵۰۱۵۰۱۵۰ / نام: ساسان / شهر: تبریز

$$الف) m = \frac{dy}{dx} = \frac{x-2}{2-x} = -1 \rightarrow \left| \begin{matrix} x \\ -2 \end{matrix} \right| \Rightarrow -2 = -2 \cdot 0 + b \Rightarrow y = -x + 18$$

$$ب) m = -2 \rightarrow m = m' \rightarrow \left| \begin{matrix} x \\ -2 \end{matrix} \right| \Rightarrow -2 = -2x + b \Rightarrow y = -2x + 14$$

$$ج) m = -\frac{1}{2} \rightarrow m' = -\frac{1}{m} = 2 \Rightarrow \left| \begin{matrix} x \\ 2 \end{matrix} \right| \Rightarrow 2 = 2x + b \Rightarrow y = x - 10$$

$$د) m = \tan \theta = \frac{\sin \theta}{\cos \theta} \Rightarrow \tan 45^\circ = \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}} = \sqrt{2} \rightarrow \left| \begin{matrix} x \\ \sqrt{2} \end{matrix} \right| \Rightarrow y - 2 = \sqrt{2}(x - 2) \Rightarrow y = \sqrt{2}x - \sqrt{2} + 2$$

$\theta = 45^\circ$

$$الف) AB = \sqrt{dx^2 + dy^2} \Rightarrow AB = \sqrt{(x+1)^2 + (y-2)^2} = 5$$

$$ب) d = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} \Rightarrow d = \frac{|4 + 12 - 3|}{\sqrt{1^2 + 1^2}} = \frac{11}{\sqrt{2}} = 7.78$$

$$ax + by + c = 0$$

$$x + y - 3 = 0$$

$$الف) ax + by = \frac{c+c'}{r} \rightarrow \begin{cases} 2x + 3y = 6 \\ 3x + 2y = 6 \end{cases} \rightarrow 2x + 3y = 6$$

$$ب) \begin{cases} 2x + 3y - 6 = 0 \\ 3x - 2y - 6 = 0 \end{cases} \rightarrow d = \frac{|c' - c|}{\sqrt{a^2 + b^2}} \Rightarrow \frac{|-6 - 6|}{\sqrt{2^2 + 3^2}} = \frac{12}{\sqrt{13}} = 3.33$$

$$2x - 3y - 1 = 0, 2x + 3y - 3 = 0$$

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

$$m = -2, m' = 2$$

$$\tan \alpha = \frac{|m - m'|}{|1 + mm'|} = \frac{|-2 - 2|}{|1 - 4|} = \frac{4}{3} \Rightarrow \alpha = 53.1^\circ \rightarrow \alpha_{\text{میان}} \rightarrow \beta = 180 - 53.1 = 126.9^\circ \rightarrow \beta_{\text{میان}}$$

الف) $AB = \sqrt{dx^2 + dy^2}$

$AB = \sqrt{(1+d)^2 + (-r-c)^2} = 10$

ب) $m\left(\frac{x_A + x_B}{r}, \frac{y_A + y_B}{r}\right) \Rightarrow m\left(-\frac{d+r}{r}, \frac{c-r}{r}\right) \Rightarrow m \begin{vmatrix} -1 \\ 1 \end{vmatrix}$

الف) $m\left(\frac{x_1 + x_2 + x_3}{r}, \frac{y_1 + y_2 + y_3}{r}\right) = m\left(\frac{-10-r+r}{r}, \frac{-1r+r+1}{r}\right) \Rightarrow m \begin{vmatrix} -10 \\ -r \end{vmatrix}$

ب) $S = \frac{1}{r} \left| \begin{pmatrix} -10 & -r & r & 1 \\ -1 & 0 & 2 & r \end{pmatrix} \right| = \frac{9r}{r} = 9$

$\begin{vmatrix} -1 & 0 & 2 & r \\ -1 & r & 1 & -1 \end{vmatrix}$

الف) $y' = -y \rightarrow y' = -\frac{rx+1}{rx-r}$

ب) $x' = -x \rightarrow y' = \frac{-rx+1}{-rx-r}$

ج) $y = x \rightarrow x = \frac{ry+1}{ry-r} \rightarrow y = \frac{rx+1}{rx-r}$

د) $y = -x \rightarrow -y = \frac{rx+1}{-rx-r} \rightarrow y = -\frac{rx+1}{rx+r} \rightarrow x = -\frac{ry+1}{ry+r} \rightarrow y = \frac{rx+1}{rx+r}$

الف) $\begin{cases} y' = y+r \rightarrow y = y'+r \\ x' = x-r \rightarrow x = x'+r \end{cases} \rightarrow y'-r = \frac{rx'+1}{x'-1} \rightarrow y' = \frac{rx'+1+rx'-r}{x'-1} = \frac{2x'+1}{x'-1}$

ب) $\begin{cases} x' = x-r \rightarrow x = x'+r \\ y' = y-r \rightarrow y = y'+r \end{cases} \Rightarrow y'+r = \frac{rx'+1}{x'} \rightarrow y' = \frac{rx'+1-r}{x'}$

الف) $\begin{cases} 3x + 6y = 2 \\ -3x + 18y = -3 \end{cases} \rightarrow 19y = -1 \rightarrow y = -\frac{1}{19} \rightarrow x = \frac{2 - 6(-\frac{1}{19})}{3} = \frac{16}{19}$

ب) $x = \frac{6+10}{-10-3} = \frac{16}{-13} \quad y = \frac{3-2}{-10-3} = \frac{-1}{13}$