Subject:
Date

تکلیف شماره ۱۷ — لیلا مرکزی — ۱۸,۷۵

۱- شیب $= -\frac{1}{2} \Rightarrow y = -\frac{1}{2}x + b \xrightarrow{(-2,k)} 1 + b = k \Rightarrow b = k - 1$

$\xrightarrow{(4,m)} -2 + b = m \Rightarrow b = m + 2$ $\Big\}\ k - 1 = m + 2 \Rightarrow k - m = 3$

$AB = \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{(4+2)^2 + (k-m)^2} = \sqrt{45} \Rightarrow S = a^2 = \sqrt{45}^2 = 45$

(۳)

۲- A, B, C, D

$x_A + x_C = x_B + x_D \longrightarrow -1 + x = 3 - 1 - x \Rightarrow x = \frac{3}{2}$

(۳)

$AB \perp BC \longrightarrow m_{AB} = \frac{4-1}{-1-3} = -\frac{3}{4} \Rightarrow m_{BC} = \frac{4}{3}$

$m_{BC} = \frac{y-1}{\frac{3}{2} - 3} = \frac{4}{3} \Rightarrow 3y - 3 = 6 - 12 \Rightarrow y = -1 \Rightarrow C = (\frac{3}{2}, -1)$, $D = (-\frac{5}{2}, 2)$

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

$BC = \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{\frac{9}{4} + 4} = \frac{5}{2}$

$\Big\}\ AB + BC = 5 + \frac{5}{2} = \frac{15}{2} \longrightarrow$ محیط $= 2 \times \frac{15}{2} = 15$

۳- شیب $= \tan 60 = \sqrt{3}$ $\quad 2mx + (m^2 - 1)y = 3 \Rightarrow y = \frac{-2m}{m^2-1}x + \frac{3}{m^2-1}$

(۲)

$\Rightarrow \frac{-2m}{m^2-1} = \sqrt{3} \Rightarrow -2m = \sqrt{3}m^2 - \sqrt{3} \Rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0$

$\alpha - \beta = \frac{\sqrt{4 + 4\sqrt{3} \times \sqrt{3}}}{\sqrt{3}} = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$

۴- A(1,9), B(3,3), C(7,11), H

$m_{BC} = \frac{11-3}{7-3} = \frac{8}{4} = 2$ $\qquad$ فاصله نقطه A تا ضلع BC $= AH$

(۲)

$\Rightarrow y = 2x + b \xrightarrow{(3,3)} y = 2x - 3 \longrightarrow y - 2x + 3 = 0$

$AH = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} \xrightarrow{(1,9)} \frac{|9 - 2 + 3|}{\sqrt{1+4}} = \frac{10}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5}$

۵- $AB: y + 2x = 7$ $\quad 11x = 33$

$BC: 2y - 7x = -19$

$\longrightarrow x = \frac{-19 - 14}{-7 - 4} = 3 \qquad y = \frac{-38 + 49}{-7 - 4} = 1$

(۱)

فاصله B از AC $\quad BH = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|14 + 9 - 17|}{5} = \frac{32}{5} = 6.4$

PAPCO

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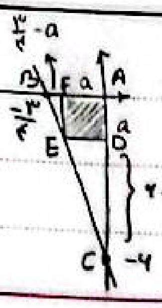

در ADEF → $AB \parallel ED \xrightarrow{\text{تالس}} \frac{CD}{AC} = \frac{ED}{AB} = \frac{EC}{BC}$ -۶

$\Rightarrow \frac{6-a}{6} = \frac{a}{\frac{3}{4}} \Rightarrow 24a = 18 - 3a \rightarrow 27a = 18 \Rightarrow a = \frac{2}{3}$ ۲

قطر $= a\sqrt{2} = \frac{2}{3}\sqrt{2}$

$y - ax = 1 \rightarrow y = ax + 1$

$ay - x = a - 1 \rightarrow y = \frac{1}{a}x + 1 - \frac{1}{a}$

$\xrightarrow{\text{موازی}} a = \frac{1}{a} \Rightarrow a = \pm 1$

$1 \neq 1 - \frac{1}{a}$ ✓ ۱,۷۵ -۷

if $a = 1 \rightarrow y = x \ , \ y = x + 1 \Rightarrow (1,2)$ ✓

if $a = -1 \rightarrow y = -x + 1 \ , \ y = -x + 2 \Rightarrow (1,2)$ ✗ $\Rightarrow a = 1$

$S = \frac{7\cancel{\sqrt{2}}}{2} \times \frac{1}{\cancel{\sqrt{2}}} = \frac{7}{2}$

$y = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{1}{\sqrt{2}} \rightarrow 5 = \sqrt{x^2 + y^2} \rightarrow 25 = x^2 + \left(\frac{1}{\sqrt{2}}\right)^2 \Rightarrow x^2 = \frac{49}{2} \rightarrow x = \frac{7\sqrt{2}}{2}$

$x - 3y = 1 \Rightarrow y = \frac{1}{3}x - \frac{1}{3}$

$d = \frac{|4 - 1|}{\sqrt{9 + 1}} = \frac{3}{\sqrt{10}} = \frac{3\sqrt{10}}{10}$ -۸

$m_{AC} = -3 \rightarrow y = -3(x - 4) = -3x + 12$

$C \Rightarrow \frac{1}{3}x - \frac{1}{3} = -3x + 12 \Rightarrow x = 3.7 \quad y = 0.9$ ۲

$S = \begin{vmatrix} 3.7 & 4 & 1 \\ 0.9 & 0 & 0 \\ 1 & 1 & 1 \end{vmatrix} \times \frac{1}{2} = \frac{1}{2}(0.9 - 3.6) = 1.35$

$m = \frac{b - a}{-\frac{1}{3} + \frac{1}{2}} = 6(b - a) = \sqrt{3} \Rightarrow b - a = \frac{\sqrt{3}}{6}$ ۲ -۹

$a = \sqrt{\left(-\frac{1}{3} + \frac{1}{2}\right)^2 + (b - a)^2} = \sqrt{\frac{4}{36}} = \frac{1}{3} \longrightarrow$ قطر مربع $= a\sqrt{2} = \frac{1}{3}\sqrt{2}$

۱۰- $m_{OA} = \frac{۴}{۳} \xrightarrow{\text{عمود}} m_L = \frac{-۳}{۴}$

$r =$ فاصله A از مبدأ $= \sqrt{۳^۲ + ۴^۲} = ۵$

$\left.\begin{array}{l} OA \perp L \\ L' \perp L \end{array}\right\} \longrightarrow OA \parallel L' \Rightarrow m_{L'} = \frac{۴}{۳}$

۲

$OA \longrightarrow y = \frac{۴}{۳}x \quad , \quad L' \Rightarrow y = \frac{۴}{۳}x + C$

فاصله L' از $OA = r = ۵ \Rightarrow \frac{C}{\sqrt{۱ + (\frac{۴}{۳})^۲}} = \frac{۳C}{۵} = ۵ \longrightarrow C = \frac{۲۵}{۳}$

$L' \longrightarrow y = \frac{۴}{۳}x + \frac{۲۵}{۳} \quad , \quad L \longrightarrow y = -\frac{۳}{۴}x - \frac{۲۵}{۴}$

$\Rightarrow \frac{۴}{۳}x_B + \frac{۲۵}{۳} = \frac{-۳}{۴}x_B - \frac{۲۵}{۴} \xrightarrow{\times ۱۲} ۱۶x_B + ۱۰۰ = -۹x_B - ۷۵ \Rightarrow x_B = -۷$

$y_B = \frac{-۲۸}{۳} + \frac{۲۵}{۳} = -۱$

$\Rightarrow x_B \times y_B = -۱ \times -۷ = \underline{۷}$