ریاضی مکملیان یازدهم A

۱)

$m = \frac{\Delta x}{\Delta y} = \frac{m-K}{4-(-2)} = \frac{m-K}{6} = -\frac{1}{2} \Rightarrow m-K = -3 \Rightarrow |m-K| = 3 = \Delta y$

$AB = \sqrt{(\Delta x)^2 + (\Delta y)^2} = \sqrt{36+9} = 3\sqrt{5} \Rightarrow S = 45$

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۲)

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

$m_{AB} = m_{CD} = -\frac{3}{4} = \frac{3}{-1-2x} \Rightarrow -1-2x = -4$

$x = \frac{3}{2} \Rightarrow C(\frac{3}{2}, y)$

$D(-\frac{5}{2}, y+3)$

$m_{BC} \times m_{CD} = -1 \Rightarrow m_{BC} = \frac{4}{3} = \frac{y-1}{-\frac{3}{2}} \Rightarrow y-1 = -2 \Rightarrow y = -1$

$m_{CD} = -\frac{3}{4}$

$\Rightarrow C(\frac{3}{2}, -1), D(-\frac{5}{2}, 2) \quad BC = \sqrt{(\frac{3}{2})^2 + 2^2} = \frac{5}{2}$

$\Rightarrow$ محیط $= 2 \times (\frac{5}{2} + 5) = 15$

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۳)

$y = \left(\frac{-2m}{m^2-1}\right)x + \frac{3}{m^2-1}$

$a = \tan\alpha = \sqrt{3}$, $\alpha = 60°$

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

$|m_2 - m_1| = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{4+12}}{\sqrt{3}} = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$

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۴)

$BC: y = 2x - 3 \Rightarrow \boxed{y - 2x + 3 = 0}$

$m = \frac{\Delta y}{\Delta x} = \frac{11-3}{7-3} = 2, \quad y = 2x + b \xrightarrow{(3,3)} b = -3$

$AH = \frac{|9-2+3|}{\sqrt{1^2+(-2)^2}} = 2\sqrt{5}$

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۵)

$AB = BC$

$y = -2x + 7$

$\Rightarrow y = \frac{7}{2}x = \frac{19}{2}$

$-2x + 7 = \frac{7}{2}x - \frac{19}{2} \Rightarrow \frac{11}{2}x = \frac{33}{2} \Rightarrow x_B = 3 \xrightarrow{y=-2x+7} y_B = 1$

$BH = \frac{|4-9-17|}{\sqrt{4^2+(-3)^2}} = \frac{22}{5} = 4{,}4$

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۶)

$\frac{x}{-\frac{3}{4}} + \frac{y}{-6} = 1 \Rightarrow -6x - \frac{3}{4}y = \frac{9}{2} \xrightarrow{x=y} -\frac{27}{4}x = \frac{9}{2} \Rightarrow x = -\frac{2}{3}, \ y = -\frac{2}{3}$

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

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۷)

$d_1: y = ax + 1$

$d_2: y = \frac{1}{a}x + \frac{a-1}{a}$

موازی $\Rightarrow a = \frac{1}{a} \Rightarrow a^2 = 1 \Rightarrow a = \pm 1$

$a = 1 \rightarrow d_1: y = x + 1, \ d_2: y = x$ — نقطه (۱،۱) صدق نمی‌کند

$a = -1 \quad d_1: y = -x + 1, \ d_2: y = -x + 2$ — نقطه صدق نمی‌کند

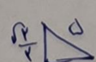
$\Downarrow$

$a = 1$

$d_1: y - x = 1$

$d_2: y - x = 0$

$\frac{|c-c'|}{\sqrt{a^2+b^2}} = \frac{|1-0|}{\sqrt{2}} = \frac{\sqrt{2}}{2}$



$\sqrt{25 - \frac{1}{2}} = \frac{49}{2} = \frac{7\sqrt{2}}{2}$

$\Rightarrow \frac{\sqrt{2}}{2} \times \frac{7\sqrt{2}}{2} = 3{,}5$

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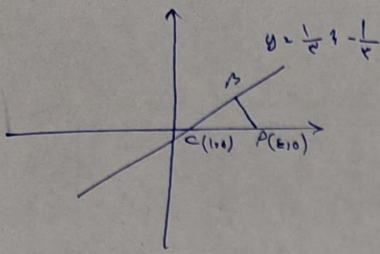

$d_1: x-3y=1 \Rightarrow y=\frac{1}{3}x-\frac{1}{3}$

$d_2: y=-3x+b \xrightarrow{(4,0)} 0=-12+b \Rightarrow b=12$

$\Rightarrow y=-3x+12$

$d_1=d_2 \Rightarrow \frac{1}{3}x-\frac{1}{3}=-3x+12 \Rightarrow \frac{10}{3}x=\frac{37}{3} \Rightarrow x=3.7$

$\xRightarrow{d_2} y=0.9 \Rightarrow B(3.7,\ 0.9)$

بیشترین مساحت به ازای C روی محور xها باشد

$\Rightarrow 0=\frac{1}{3}x-\frac{1}{3} \Rightarrow x=1,\ y=0 \Rightarrow C(1,0)$

$\Rightarrow AC=\sqrt{3^2+0^2}=3 \qquad BH=\frac{0.9}{1}=0.9 \Rightarrow S_{\overset{\triangle}{ABC}}=\frac{1}{2}\times 3\times 0.9=1.35$

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$m=\sqrt{3}=\dfrac{b-a}{-\frac{1}{3}+\frac{1}{2}}=\dfrac{b-a}{\frac{1}{6}} \Rightarrow b-a=\frac{\sqrt{3}}{6}$

$A(-\frac{1}{3},a)$
$B(-\frac{1}{2},b)$
$\Rightarrow AB=\sqrt{\Delta x^2+\Delta y^2}=\sqrt{(\frac{1}{6})^2+(\frac{\sqrt{3}}{6})^2}=\frac{2}{6}=\frac{1}{3} \Rightarrow$ قطر مربع $=\frac{\sqrt{2}}{3}$

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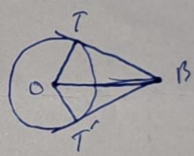

$m_{OT}=\dfrac{0-(-4)}{-(-3)}=\dfrac{4}{3} \quad \Big\} \quad m_{OT'}=-\dfrac{3}{4}$

$m_{OT}\times m_{OT'}=-1$

$r=OT=OT'=\sqrt{4^2+3^2}=5 \Rightarrow m_{OT'}=-\frac{3}{4} \Rightarrow OT': y=-\frac{3}{4}x+b \xrightarrow{(0,0)} y=-\frac{3}{4}x$

$\Rightarrow T'(x,\ -\frac{3}{4}x)$

$OT'=\sqrt{x^2+\frac{9}{16}x^2}=\sqrt{\frac{25}{16}x^2}=|\frac{5}{4}x|=5 \xRightarrow{\text{ناحیه دوم } x<0} x=-4 \Rightarrow T'(-4,\ 3)$

$\Rightarrow x_T+x_{T'}=x_O+x_B \Rightarrow x_B=-7 \qquad y_T+y_{T'}=y_O+y_B \Rightarrow y_B=-1$

$\Rightarrow x_B\times y_B=+7$