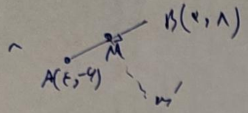
رادین مکملیان یازدهم A

(۱

$A(4,-6)\ ,\ B(2,8) \Rightarrow x_M = \frac{4+2}{2} = 3\ ,\ y_M = \frac{-6+8}{2} = 1 \quad M(3,1)$



$m_{(AB)} \times m' = -1 \quad m_{AB} = \frac{8-(-6)}{2-4} = -7 \Rightarrow m' = \frac{1}{7}$

$\frac{1}{7}(x-3) = y-1 \Rightarrow \frac{1}{7}x - \frac{3}{7} + \frac{7}{7} = y \Rightarrow y = \frac{1}{7}x + \frac{4}{7}$

(۲

$C(-1,3)\ \ B(-4,7)\ \ A(3,1)$

$BC = \sqrt{(-4-(-1))^2 + (7-3)^2} = \sqrt{25} = 5 \qquad m_{BC} = \frac{7-3}{-4-(-1)} = \frac{4}{-3}$

$\Rightarrow (x-(-1))\left(\frac{4}{-3}\right) = (y-3) \Rightarrow -\frac{4}{3}x - \frac{4}{3} + \frac{9}{3} = y \Rightarrow -\frac{4}{3}x + \frac{5}{3} - y = 0$

$d = \frac{\left|-\frac{4}{3}(3) + \frac{5}{3} - 1\right|}{\sqrt{\left(-\frac{4}{3}\right)^2 + 1^2}} = \frac{\left|-4 + \frac{5}{3} - 1\right|}{\sqrt{\frac{16}{9} + \frac{9}{9}}} \Rightarrow \frac{\frac{10}{3}}{\frac{5}{3}} = 2 \Rightarrow |2-5| = 3$

(۳

$4y = ax + 2 \Rightarrow 4y - ax - 2 = 0$

$2y - x = 7 \Rightarrow 4y - 2x - 7 = 0$

$d = \frac{|c-c'|}{\sqrt{a^2+b^2}} \Rightarrow d = \frac{|-7-(-2)|}{\sqrt{4^2 + (-2)^2}} = \frac{5}{\sqrt{20}} = \frac{\sqrt{5}}{2}$

$\Rightarrow 2r = \frac{\sqrt{5}}{2} \Rightarrow r = \frac{\sqrt{5}}{4} \qquad S = r^2\pi = \left(\frac{\sqrt{5}}{4}\right)^2\pi = \frac{5}{16}\pi$

(۴

$A(2,3)$
$B(4,1)$
$C(-1,-3)$

$x_M = \frac{x_A + x_B}{2} = \frac{2+4}{2} = 3 \qquad y_M = \frac{3+1}{2} = 2$

$d = \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{(3-(-1))^2 + (2-(-3))^2} = \sqrt{41}$

$m_{AB} = \frac{\Delta y}{\Delta x} = \frac{3-1}{2-4} = -1 \qquad (y-y_0) = m(x-x_0) \Rightarrow y-1 = -1(x-4)$

$\Rightarrow y = -x + 5 \qquad d = \frac{|ax_0 + by_0 + c|}{\sqrt{a^2+b^2}} = \frac{|-(-1)+5-15|}{\sqrt{1+1^2}} = \frac{9}{\sqrt{2}}$

$CH^2 + MH^2 = CM^2 \Rightarrow \left(\frac{9}{\sqrt{2}}\right)^2 + MH^2 = (\sqrt{41})^2 \Rightarrow MH = \frac{\sqrt{2}}{2}$

سوال ۵)

$(m+1)x-(2m-3)y+1=0 \quad (2m-1)x+(5-m)y-7=0$

$m=\frac{m+1}{2m-3} \quad m'=\frac{2m-1}{-5+m} \quad mm'=-1 \Rightarrow \frac{m+1}{2m-3}\times\frac{2m-1}{-5+m}=-1$

$\Rightarrow 2m^2+m-1=-2m^2+9m-10 \Rightarrow 5m^2-5m+11=0 \xrightarrow{\Delta} \Delta<0$ جواب ندارد

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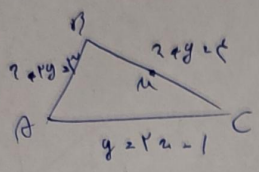
۶)

$AB: x+2y=2$

$AC: y=2x-1$

$BC: x+y=4$



$y=2x-1 \\ x+y=4 \Rightarrow x+(2x-1)=4 \Rightarrow 3x=5 \Rightarrow x=\frac{5}{3}$

$\frac{5}{3}+y=\frac{12}{3} \Rightarrow y=\frac{7}{3}$

$x+y=4 \\ x+2y=2 \Big\} \Rightarrow 4-y=2 \Rightarrow y=-1 \Rightarrow x-1=4 \Rightarrow x=5 \quad B(5,-1) \quad A(1,1)$

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

$x_M=\frac{\frac{5}{3}+\frac{10}{3}}{2}=\frac{15}{6} \quad y_M=\frac{\frac{7}{3}+\frac{2}{3}}{2}=\frac{3}{2} \quad M\left(\frac{5}{2},\frac{3}{2}\right)$

$AM=\sqrt{\left(1-\frac{5}{2}\right)^2+\left(\frac{3}{2}-1\right)^2}=\sqrt{\frac{25}{4}}=\frac{5\sqrt{2}}{2} \quad m_{AB}=\frac{\frac{7}{3}+1}{\frac{5}{3}-1}=1$

$1(x-5)=y+1 \Rightarrow x-y-6=0 \quad d=\frac{|1(1)-1-6|}{\sqrt{1^2+1^2}}=\sqrt{2}$

$\frac{AM}{AH}=\frac{\frac{5\sqrt{2}}{2}}{\sqrt{2}}=\frac{5}{2}$

سوال ۱۷

$m = -\frac{1}{2}$ $\quad y - ax + b = 0 \quad a = -\frac{1}{2} \Rightarrow y + \frac{1}{2}x + b = 0$

$d = \frac{|a(0) + b(0) + c|}{\sqrt{\frac{1}{2}^2 + 1^2}} = \frac{|c|}{\sqrt{\frac{5}{4}}} = \sqrt{20} \Rightarrow |c| = 2\sqrt{5} \times \frac{\sqrt{5}}{2} \Rightarrow c = \pm 5$

$c = 5 \Rightarrow y + \frac{1}{2}x + 5 = 0 \overset{y=0}{\Rightarrow} x_1 = -\frac{5}{2}$

$\Rightarrow |x_1 - x_2| = 5$

$c = -5 \Rightarrow y + \frac{1}{2}x - 5 = 0 \Rightarrow x_2 = \frac{5}{2}$

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$my_1 - 4x = 2m \quad y_2 + mx = x + 2 \quad y_1 = y_2$

$y_1 = \frac{4}{m}x + 2 \quad y_2 = x(1-m) + 2$

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

$\Rightarrow \frac{4}{m}(x) = (x)(1-2m) \overset{x=0}{\Rightarrow} my = 2m \Rightarrow y = 2 \Rightarrow h = 2$

$y = 0 \Rightarrow y = x(1-m) + 2 \Rightarrow x = \frac{2}{m-1}$ $\Big\}$ $\left|\frac{2}{m-1} - \left(-\frac{m}{2}\right)\right| \times 2 \times \frac{1}{2} = \frac{5}{2} \Rightarrow \left|\frac{4+m^2-m}{2m-2}\right| = \frac{5}{2}$

$y = 0 \Rightarrow x = -\frac{m}{2}$

$\frac{m^2 - m + 4}{2m-2} = \frac{5}{2} \Rightarrow m^2 - 6m + 9 = 0 \Rightarrow (m-3)^2 = 0 \Rightarrow m = 3$

$\frac{m^2 - m + 4}{-2m+2} = \frac{5}{2} \Rightarrow m^2 + 4m - 1 = 0 \Rightarrow P = \frac{c}{a} = -1$

$\Rightarrow 3 \times -1 = -3$

۱۹

$y = 2x - 3 \quad \frac{x + x'}{2} = 2 \quad x + x' = 4 \Rightarrow x = 4 - x'$

$\frac{y + y'}{2} = -2 \Rightarrow y + y' = -4 \Rightarrow y = -y' - 4$

$(-y' - 4) = 2(4 - x') - 3 \Rightarrow y' = 2x' - 4 + 3 - 8 \Rightarrow y' = 2x' - 9$

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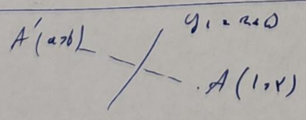
$A(1,2) \quad y_1 = x + 5$



$m' = AA' \quad m = 1 \Rightarrow m'm = -1 \Rightarrow m' = -1$

$(y_2 - y_0) = m(x - x_0) \Rightarrow y_2 - 2 = -1(x - 1) \Rightarrow y_2 = -x + 3$

$y_1 = y_2 \Rightarrow -x + 3 = x + 5 \Rightarrow x = -1 \quad y = -(-1) + 3 = 4$

$a = 2(-1) - 1 = -3$
$b = 2(4) - 2 = 6$ $\Big\}$ $2b - a = 2(6) - (-3) = 15$