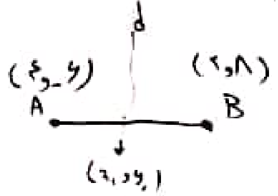
باسمه تعالی — نام و نام خانوادگی: علی رباتی — امتحان تکلیف شماره ۱۶۰۰ — کلاس یازدهم A

۱-



$x_1 = \frac{4+2}{2} = 3 \qquad y_1 = \frac{8-6}{2} = 1$

$m_{AB} = \frac{8--6}{2-4} = \frac{14}{-2} = -7 \Rightarrow m_d = \frac{1}{7}$

$y = \frac{1}{7}x + b \qquad 1 = \frac{3}{7} + \frac{4}{7} \Rightarrow \boxed{7y = x+4}$

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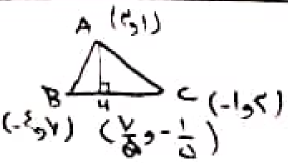


$BC = \sqrt{(-3)^2+(4)^2} = 5$

$m_{BC} = \frac{7-3}{-4+1} = \frac{4}{-3} \Rightarrow m_{AH} = \frac{3}{4}$

$y = \frac{3}{4}x + b = \frac{3}{4}x - \frac{5}{4} \qquad 4y = 3x-5$

$1 = \frac{9}{4} + b \Rightarrow b = -\frac{5}{4}$

$H \begin{cases} 4y = 3x-5 \\ y = -\frac{4}{3}x + \frac{5}{3} = 3y = -4x+5 \end{cases}$

$9x - 15 = -16x + 20$

$25x = 35$

$x = \frac{35}{25} = \frac{7}{5}$

$AH = \sqrt{(3-\frac{7}{5})^2 + (1+\frac{1}{5})^2} \qquad \frac{64}{25} + \frac{36}{25} = \sqrt{\frac{100}{25}} = 2$

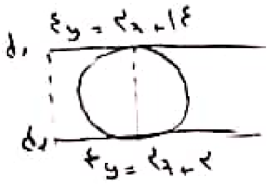
$BC - AH = 5 - 2 = \boxed{3}$

۳-

دو خط موازی $\Rightarrow m_1 = m_2$

$2y - x = 7 \Rightarrow 2y = x+7 \Rightarrow m = \frac{1}{2}$

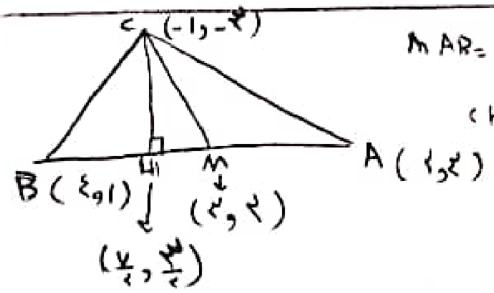
$4y = ax+2 \qquad 4y = ax+2 \Rightarrow m = \frac{1}{2} = \frac{a}{4} \Rightarrow \boxed{a = 2}$



$d_1 d_2 = \frac{|c-c'|}{\sqrt{a^2+b^2}} = \frac{|14-2|}{\sqrt{16+4}} = \frac{12}{\sqrt{20}}$ = قطر دایره $\Rightarrow \frac{6}{\sqrt{20}}$ = شعاع دایره

$S = \pi r^2 = (\frac{6}{\sqrt{20}})^2 \pi = \frac{36}{20}\pi = \boxed{\frac{9}{5}\pi}$

۴-



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

معادله CH $\Leftarrow \boxed{y_1 = x-2}$ $\quad \boxed{y_2 = -x+5}$ معادله AB $\quad y_1 = y_2 \Rightarrow$

$H \Rightarrow x - 2 = -x + 5$

$2x = 7$

$\boxed{x = \frac{7}{2}}$

$MH = \sqrt{(3-\frac{7}{2})^2 + (2-\frac{3}{2})^2} = \boxed{\frac{\sqrt{2}}{2}}$

$\frac{1}{4} \qquad \frac{1}{4}$

۵-

$m_1 = -\frac{1}{m_2} \qquad m_1 \times m_2 = -1$

$(3m-2)x + (5-m)y - 7 = 0 \qquad m_1 = \frac{3m-2}{5-m}$

$(m+1)x - (2m-4)y - 1 = 0 \qquad m_2 = \frac{m+1}{4-2m}$

$m_1 \times m_2 = \frac{3m-2}{5-m} \times \frac{m+1}{4-2m} = -1 \Rightarrow \frac{3m-2}{5-m} = \frac{-(4-2m)}{m+1} \Rightarrow \frac{3m-2}{5-m} = \frac{2m-4}{m+1}$

$(m+1)(3m-2) = (2m-4)(5-m)$

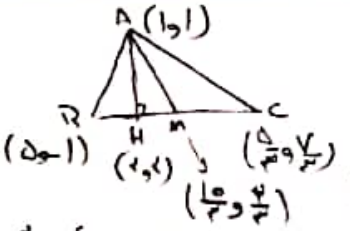
$3m^2 + m - 2 = -2m^2 + 14m - 20$

$5m^2 - 13m + 18 = 0$

$\Delta < 0 \Rightarrow$ ریشه ندارد

به ازای هیچ مقدار m این رابطه برقرار نیست $\varnothing$

$$\begin{cases} AB: 2x+2y=4 \\ AC: y=2x-1 \\ BC: x+y=3 \end{cases}$$



$BC: y=-x+3 \Rightarrow$

$AH = y = x$

$H \Rightarrow -x+3 = x$

$2x = 3$

$x = \frac{3}{2}$

$\frac{3}{2}$ — 4

$AB: 2y = -x+4 \quad -x+4 = 3x-2$

$AC: y = 2x-1 \Rightarrow A: \quad 6 = 6x$

$x = 1 \Rightarrow y = 1$

$AB: 2y = -x+4$

$BC: y = -x+3 \Rightarrow B: \quad -x+4 = -2x+6$

$x = 2 \quad y = 1$

$AC = y = 2x-1$

$BC = y = -x+3 \Rightarrow C: \quad 2x-1 = -x+3$

$3x = 4$

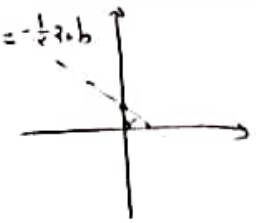
$y = \frac{5}{2} \quad x = \frac{4}{3}$

$M = \left(\frac{10}{7}, \frac{9}{7}\right)$

$$\frac{AM}{AH} = \frac{\sqrt{\left(\frac{5}{7}\right)^2+\left(-\frac{1}{7}\right)^2}}{\sqrt{2}} = \frac{\sqrt{\frac{50}{49}}}{\sqrt{2}} = \frac{\frac{5\sqrt{2}}{7}}{\sqrt{2}} = \frac{5\sqrt{2}}{7\sqrt{2}} = \frac{5}{7}$$

5 — 7

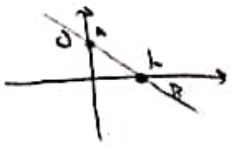
$m = -\frac{1}{2}$



$y = -\frac{1}{2}x \pm 5$

$2y = -x + 10$

$2y = -x - 10$



$d(0,0) \text{ to } d = \frac{|ax_1+by_1+c|}{\sqrt{a^2+b^2}} = \sqrt{20}$

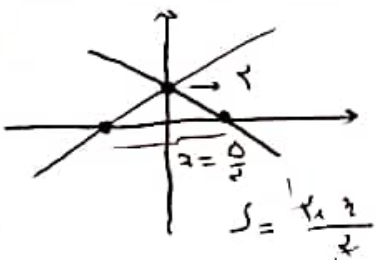
$\frac{|c|}{\sqrt{5}} = \sqrt{20} = 2\sqrt{5} \quad \frac{1}{2}+1$

$|c| = \sqrt{5}\cdot\sqrt{5} = 5 \quad c = \pm 5$

$A = (0,5) \quad B = (10,0)$

$AB = \sqrt{25+100} = \sqrt{125} = 5\sqrt{5}$

8 — 9



$y = (1-m)x+2 \quad 0 = (1-m)x+2 \quad (m-1)x_1 = 2$

$my = 4x+2m \quad 0 = 4x+2m \quad 4x_1 = -2x_2$

$x_1 = \frac{2}{m-1}$

$x_2 = -m$

$x_1 = -\frac{m}{2} \quad x_2 = -\frac{m}{2}$

$x = x_2 - x_1$

$\frac{5}{2} = -\frac{m}{2} - \frac{2}{m-1}$

$5 = -m + \frac{4}{m-1} \quad 5m-5 = -m^2+m+4 \Rightarrow m^2+4m-9 = 0$

9

$y = 2x-2 \quad y = 2x-7$

$M(2,2)$

$y = 2x-7$

$M(2,-3)$

$y = 2x-2$

$ax+by = \frac{c+c'}{2}$

$\frac{-2+c'}{2} = -3$

$\Rightarrow c' = -9$

10

$(1,2) \quad y = 2x+3$

$(-1,4) \quad A'(a,b)$

$y = -x+2$

$-x+2 = x+3$

$-2 = 2x$

$-1 = x$

$y = 4$

$(1,2) \quad (-1,4) \quad (a,b)$

$+2 \quad +2$

$a = -3$

$b = 6$

$2b-a = 12+3 = 15$