توجه کنید، سوال ۲ و ۴ جابجا نوشته شده

نام و نام خانوادگی: فرهام نردزنی   پاسخنامه تشریحی تکلیف شماره ۱۶   کلاس یازدهم تجربی B

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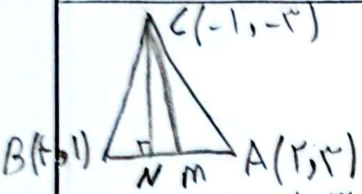
$A(4,-6)$, $B(2,8)$ $\longrightarrow m = \frac{8-(-6)}{2-4} = -7 \xrightarrow{\text{عمود منصف}} \frac{1}{7}$

نقطه میانی $\left(\frac{4+2}{2}, \frac{8-6}{2}\right) \longrightarrow (3,1) \longrightarrow y-1 = \frac{1}{7}(x-3)$

$\longrightarrow y = \frac{1}{7}x + \frac{4}{7}$

۴ (سوال ۴) ×



$M = \left(\frac{4+2}{2}, \frac{1+3}{2}\right) \longrightarrow (3,2)$

$m_{AB} = \frac{1-3}{4-2} = \frac{-2}{2} = \boxed{-1} \longrightarrow y+3 = -1(x-2) \to m_{CH} = 1 \longrightarrow y = x-2$

$y = -x+5$

$\Longrightarrow \begin{cases} y = -x+5 \\ y = x-2 \end{cases} \longrightarrow x-2 = -x+5$

$2x = 7 \Rightarrow x = \frac{7}{2}$, $y = \frac{3}{2} = 1.5$

$\Rightarrow MH = \sqrt{(3.5-3)^2 + (1.5-2)^2} = \sqrt{0.5} = \boxed{\frac{1}{\sqrt{2}}}$

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

$4y = 2x + 2 \longrightarrow y = \frac{1}{2}x + \frac{1}{2}$

$d = \frac{\left|\frac{7}{2} - \frac{1}{2}\right|}{\sqrt{1+\frac{1}{4}}} = \frac{3}{\sqrt{\frac{5}{4}}} = \frac{6}{\sqrt{5}} \xrightarrow{\text{شعاع}} \frac{3}{\sqrt{5}}$

مساحت $= \pi r^2 = \pi\left(\frac{3}{\sqrt{5}}\right)^2 = \pi \cdot \frac{9}{5} = \boxed{\frac{9\pi}{5}}$

× (سوال ۲)

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

مساحت $= \frac{1}{2}\left(3(7-3) + (-4)(3-1) + (-1)(1-7)\right) = \frac{1}{2}(10) = 5$

$\Rightarrow AH = \frac{2\times 5}{5} = \frac{10}{5} = 2$

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

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

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

$m_1 \cdot m_2 = -1 \Longrightarrow \left(\frac{-3m+2}{5-m}\right)\left(\frac{-m-1}{2m-4}\right) = -1$

$\frac{(3m-2)(m+1)}{(5-m)(2m-4)} = -1 \Longrightarrow 5m^2 + 13m + 18 = 0 \Longrightarrow \Delta < 0$ هیچ مقدار

$\rightarrow AM = \sqrt{\left(\frac{1}{2}-1\right)^2+\left(\frac{1}{2}-1\right)^2} = \frac{\sqrt{2}}{2}$ $AH = d = \frac{|Ax_0+by_0+c|}{\sqrt{a^2+b^2}} \Rightarrow \frac{|1+1-4|}{\sqrt{2}} = \frac{2}{\sqrt{2}} = \sqrt{2}$

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

$A=(1,1)$

$y=4-x$ x,y

$\hookrightarrow AB, BC = (4-y)+2y = 2 \rightarrow 4+y=2 \rightarrow y=-1$

$x=4+1=5 \rightarrow B=(5,-1)$

$\rightarrow AC, BC = 4-x = 2x-1 \rightarrow 3x=5 \Rightarrow \boxed{x=\frac{5}{3}}, \boxed{y=\frac{1}{3}}$

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

$y=-\frac{1}{2}x+5$ $\xrightarrow{x=0}$ $(0,5)$ $\quad$ $y=-\frac{1}{2}x+c$ $\xrightarrow{x=0}$ $(0,c)$

$y=-\frac{1}{2}x-2 \rightarrow x=-10, y=-2$ $\rightarrow \sqrt{(0-(-10))^2+(5-(-2))^2} = \boxed{5\sqrt{5}}$

$d=\frac{|c|}{\sqrt{1+m^2}} \Rightarrow \sqrt{20} = \frac{|c|}{\sqrt{1+\frac{1}{4}}} = \frac{2|c|}{\sqrt{5}} \Rightarrow 2|c|=10 \Rightarrow |c|=5$

$\Rightarrow c = \boxed{\pm 5}$

$mx-4y=2m \rightarrow y=\frac{m}{4}x+2 \xrightarrow{y=0} x_1=(-\frac{8}{m},0)$

$y+mx=x+2m \rightarrow y=x(-1-m)+2 \xrightarrow{y=0} x_2=(-\frac{2}{1-m},0)$

$S=\frac{1}{2}\times 2|x_2-x_1| \rightarrow \frac{5}{2}=\left|-\frac{8}{1-m}-\frac{8}{m}\right|$

$\frac{5}{2}=-\frac{8}{m}-\frac{8}{1-m}$

$-\frac{5}{2}=-\frac{8}{m}-\frac{8}{1-m}$

$\rightarrow 5m-5=-m^2+m-4 \rightarrow m^2+4m-1=0$

$\rightarrow -5m+5=-m^2+m-4 \rightarrow m^2-6m+9=0$

$\Delta=0=(-3)^2: m=3$

$S=2(-1)^2=\boxed{-2}$

$y=2x-2 \rightarrow M=(2,-2)$

$\rightarrow x=2a-x, \quad y=2b-y$

$x=4-x, \quad y=-4-y \rightarrow y=-4-(2x-2)=-4-2x+2$

$\Rightarrow -2x-1 \xrightarrow{x=4-x} -2(4-x)-1=-8+2x-1=\boxed{2x-9}$

$A(1,2)$

$y=x+5 \rightarrow A'$ $\quad x_{A'}=2x_B-x_A=-2-1=-3$

$y_{A'}=2y_B-y_A=7-2=5$

$2b-a=? \rightarrow 2(4)-(-2)=\boxed{10}$

$y-2=-x+1 \rightarrow y=-x+3$

$\rightarrow -x+3=x+5 \rightarrow 2x=-2 \rightarrow \boxed{x=-1}, \boxed{y=4}$