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نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره ۱۲... کلاس: (نخستین)

$$A(4, -4) \quad B(2, 1) \rightarrow m = \frac{1 - (-4)}{2 - 4} = -\frac{5}{2}$$

$$m' = -\frac{1}{m} \quad m' = \frac{1}{5/2}$$

$$\text{نقطه وسط} \rightarrow \left(\frac{4+2}{2}, \frac{-4+1}{2} \right) = (3, -1.5)$$

$$\left. \begin{aligned} y &= ax + b \\ 1 &= \frac{1}{5/2} \times 2 + b \quad b = \frac{1}{5} \\ y - 1 &= \frac{1}{5}(x - 2) \\ y &= \frac{x}{5} + \frac{3}{5} \end{aligned} \right\}$$

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$$A(3, 1) \quad B(-4, 5) \quad C(-1, 3) \quad m_{BC} = \frac{3-5}{-1+4} = -\frac{2}{3} \rightarrow$$

$$y - 5 = -\frac{2}{3}(x + 4) \quad 3x + 2y - 10 = 0 \quad BC = \sqrt{(-1+4)^2 + (3-5)^2} = \sqrt{10} = \omega$$

$$AH = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}} = \frac{|1(3) + 2(1) - 10|}{\sqrt{3^2 + 2^2}} = \frac{5}{\sqrt{13}} = r$$

$$BC - AH = \omega - r = \boxed{3}$$

2

$$3y - x = 5 \quad y = \frac{1}{3}x + \frac{5}{3} \quad 4y = ax + 2 \quad y = \frac{a}{4}x + \frac{1}{2}$$

$$m_1 = m_2 \text{ موازی} \rightarrow \frac{1}{3} = \frac{a}{4} \quad \boxed{a = \frac{4}{3}}$$

$$\left\{ \begin{aligned} y &= \frac{1}{3}x + \frac{5}{3} \\ y &= \frac{1}{3}x + \frac{1}{2} \end{aligned} \right.$$

$$d = \frac{|\frac{5}{3} - \frac{1}{2}|}{\sqrt{1 + \frac{1}{9}}} = \frac{\frac{7}{6}}{\sqrt{\frac{10}{9}}} = \frac{7}{\sqrt{10}} = \frac{7 \times 2}{\sqrt{40}} = \frac{14}{\sqrt{40}} \quad r = \frac{d}{2} = \frac{7}{\sqrt{40}} \quad S = \pi r^2 = \pi \left(\frac{7}{\sqrt{40}} \right)^2 = \boxed{\frac{49\pi}{40}}$$

3

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

$$M \rightarrow AB \text{ bisector} \rightarrow M\left(\frac{4+2}{2}, \frac{1+3}{2}\right) = (3, 2) \quad H \text{ در } AB \rightarrow m' = +1$$

$$CH \rightarrow y + 3 = 1(x + 1) \quad y = x - 2 \quad H = \begin{cases} y = -x + 5 \\ y = x - 2 \end{cases} \quad x = \frac{5}{2} \quad y = \frac{3}{2}$$

$$\left. \begin{aligned} M(3, 2) \\ H\left(\frac{5}{2}, \frac{3}{2}\right) \end{aligned} \right\} MH = \sqrt{\left(\frac{5}{2} - 3\right)^2 + \left(\frac{3}{2} - 2\right)^2} = \sqrt{\frac{1}{4} + \frac{1}{4}} = \sqrt{\frac{1}{2}} = \boxed{\frac{1}{\sqrt{2}}}$$

4

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

$$x - (3m - 4)y + 1 = 0 \rightarrow m_2 = \frac{m + 1}{3m - 4}$$

5

$$\text{موازی} \rightarrow m_1 \times m_2 = -1 \quad -\frac{3m - 2}{2 - m} \times \frac{m + 1}{3m - 4} = -1 \quad (3m - 2)(m + 1) = (2 - m)(3m - 4)$$

$$3m^2 + 3m - 2m - 2 = 10m - 20 - 3m^2 + 4m \quad m^2 - 3m + 3 = 0 \quad \Delta < 0 \quad \text{وجود ندارد}$$

$$\begin{cases} x+ry=r \\ y=r(x-1) \end{cases} \rightarrow \alpha=1 \begin{cases} x+ry=r \\ y=1 \end{cases} \alpha=\omega \begin{cases} y=r(x-1) & x=\frac{\omega}{r} \\ x+y=r & y=\frac{r}{r} \end{cases}$$

$$m_{BC} = \frac{\frac{r}{r} + 1}{\frac{\omega}{r} - \omega} = -1 \quad y+1 = -1(x-\omega) \quad y = -x + r \quad \frac{b_{BC}}{BC} \Rightarrow M\left(\frac{\omega + \frac{\omega}{r}}{r}, \frac{-1 + \frac{r}{r}}{r}\right) \Rightarrow M\left(\frac{1+\omega}{r}, \frac{r-1}{r}\right)$$

$$M\left(\frac{1+\omega}{r}, \frac{r-1}{r}\right) / BC = -1 \quad AH = 1 \rightarrow y-1 = 1(x-1) \quad y = x \quad \frac{x+y=r}{H(r,r)} \quad \textcircled{5}$$

$$AM = \sqrt{\left(\frac{1+\omega}{r} - 1\right)^2 + \left(\frac{r-1}{r} - 1\right)^2} = \sqrt{\frac{\omega^2}{r^2}} = \frac{\omega\sqrt{r}}{r} \quad \frac{AM}{AH} = \frac{\frac{\omega\sqrt{r}}{r}}{\frac{\sqrt{r}}{r}} = \boxed{\frac{\omega}{r}}$$

$$AH = \sqrt{(r-1)^2 + (r-1)^2} = \sqrt{r}$$

$$m = -\frac{1}{r} \rightarrow y = -\frac{1}{r}x + b \quad x+r y - r b = 0$$

$$\text{المسافة من نقطة الى خط} \rightarrow d = \frac{|c|}{\sqrt{a^2+b^2}} = \sqrt{r_0} \quad \frac{|1-rb|}{\sqrt{1+r^2}} \rightarrow \frac{r|b|}{\sqrt{\omega}} = \sqrt{r_0} \quad |b| = \omega \quad b = \pm \omega \quad \textcircled{5}$$

$$\underline{x=0} \rightarrow A(0, b) \quad \underline{y=0} \rightarrow B(rb, 0)$$

$$\Rightarrow AB = \sqrt{rb^2 + b^2} = \sqrt{\omega b^2} \quad \frac{|b|\sqrt{\omega}}{\omega} \rightarrow \boxed{\omega\sqrt{\omega}}$$

$$my - rx = r \rightarrow y = \frac{rx}{m} + r \quad y + mx = x + r \rightarrow y = (1-m)x + r$$

$$\underline{y \rightarrow \infty} \rightarrow x = 0 \quad y_1 = r \quad y_2 = r \quad \left. \begin{matrix} \underline{x \rightarrow \infty} \rightarrow y = 0 \quad x_1 = \frac{r}{1-m} \quad x_2 = \frac{-r}{1-m} \end{matrix} \right\} M_1\left(r, \frac{m}{r}\right) \quad M_2\left(r, -\frac{r}{1-m}\right)$$

$$S_1 = \frac{1}{r} |ab| = \frac{1}{r} \times r \times \frac{m}{r} = \frac{1}{r} |m| \rightarrow \frac{1}{r} |m| = \frac{\omega}{r} \quad m = \pm \omega$$

$$S_2 = \frac{1}{r} |ab| = \frac{1}{r} \times r \times \frac{-r}{1-m} = \frac{r}{|1-m|} \rightarrow \frac{r}{|1-m|} = \frac{\omega}{r} \quad m = \frac{1}{\omega} \quad \frac{a}{\omega_{x=1} = -r}$$

$$\text{المسافة من نقطة الى خط} \rightarrow \omega x - \omega \times \frac{1}{\omega} \times \frac{a}{\omega} = | -9 |$$

$$S_D = \left| \frac{m^2 - m + r}{r(m-1)} \right| / r \times \frac{1}{r} \times \frac{a}{r}$$

$$\hookrightarrow m = r, \quad m^2 + r_{m=1} = 0 \quad \frac{a}{\omega} = -1$$

$$y = rx - r \rightarrow \left(\frac{r}{r}, 0\right) \quad M(r, -r)$$

$$r = \frac{r}{r} + x' \quad r = \frac{r}{r} + x' \quad x' = \frac{\omega}{r} \rightarrow \left(\frac{\omega}{r}, -r\right) \quad m = r$$

$$-r = \frac{0+y'}{r} \quad -r = 0 + y' \quad y' = -r \rightarrow -r = r \times \frac{\omega}{r} + b \quad b = -9$$

$$\boxed{y = rx - 9} \quad \textcircled{5}$$

$$A(1, r) \quad y = x + \omega \rightarrow m = 1 \quad m' = -1 \quad y = ax + b \quad \underline{(1, r)} \rightarrow r = -1 \times 1 + b$$

$$b = r \quad y = -x + r \quad \begin{cases} y = x + \omega \\ y = -x + r \end{cases} \quad x + \omega = -x + r \quad x = -1 \quad (-1, r)$$

$$-1 = \frac{1+x'}{r} \quad -r = 1 + x' \quad x' = -r \quad (-r, 4) \rightarrow r b - a = r(4) - (-r)$$

$$r = \frac{r+y'}{r} \quad \Lambda \neq r + y' \quad y' = 4 \quad (a, b) \rightarrow \boxed{1\omega}$$