

$$\frac{m-k}{k+r} = \frac{m-k}{6} = \frac{-1}{2} \rightarrow k-m=3 \rightarrow \begin{matrix} \sqrt{1+k} \\ \sqrt{1+m} \end{matrix} = \sqrt{1+k} = \sqrt{5} \rightarrow \boxed{\sqrt{5}} \quad (1) \quad (2)$$

$$\overline{AB} = \overline{CD} \Rightarrow \begin{matrix} A \\ \sqrt{1+k} \\ B \end{matrix} \rightarrow m_{AB} = \frac{k-1}{-1-k} = \frac{-3}{k} \Rightarrow \frac{y+3-y}{-1-k-k} = \frac{3}{-2k-1} \Rightarrow k = 2k+1 \rightarrow \boxed{k = \frac{3}{2}} \quad (2) \quad (3)$$

$$m_{AO} = \frac{k}{4} = \frac{4+3-k}{4-k+1} = \frac{5-1}{-3} \rightarrow y = -x+1 = (-1) \rightarrow \overline{AD} = \overline{BC} = \sqrt{\left(\frac{3}{2}-\frac{1}{2}\right)^2 + (1+1)^2} = \sqrt{\frac{9+4}{2}} = \sqrt{\frac{13}{2}} \quad (4) \quad (5)$$

$$\rightarrow 2\left(\frac{13}{2} + \frac{13}{2}\right) = \boxed{13} = P \quad (6) \quad (7)$$

$$\tan \phi = \sqrt{3} = \frac{-2m}{m^2-1} \rightarrow \sqrt{3} m^2 + 2m - \sqrt{3} = 0 \rightarrow \frac{m}{\sqrt{3}} = \frac{-\sqrt{3}}{2} \rightarrow \frac{1}{\sqrt{3}} = \left(\frac{\sqrt{3}}{2}\right) \Rightarrow \Delta = \frac{\sqrt{3}-(-\sqrt{3})}{2} = \frac{2\sqrt{3}}{2} = \sqrt{3} \quad (8) \quad (9)$$

$$0 = m^2 + 2m - 3 \rightarrow (m+3)(m-1) \rightarrow m = -3 \text{ or } m = 1$$

$$m_{BC} = \frac{11-3}{5-3} = \frac{8}{2} = 4 \rightarrow y-3 = 4(x-3) \Rightarrow y = 4x-9 \rightarrow y-4x+9=0 \rightarrow \overline{AH} = \frac{|9-2+3|}{\sqrt{1+4}} = \frac{10}{\sqrt{5}} = \boxed{2\sqrt{5}} \quad (10) \quad (11)$$

$$B \rightarrow \begin{cases} (y+2x=7) \rightarrow 2y+4x=14 \\ 2y-4x=-19 \end{cases} \Rightarrow 11x=33 \Rightarrow x=3 \rightarrow \frac{|4-9-17|}{\sqrt{4^2+3^2}} = \frac{22}{5} = \frac{44}{10} = \boxed{4.4} = d_{BH} \quad (12) \quad (13)$$

$$A \begin{vmatrix} \frac{3}{2} \\ 0 \end{vmatrix} B \begin{vmatrix} 0 \\ -6 \end{vmatrix} \rightarrow \frac{0+6}{\frac{3}{2}-0} = \frac{-24}{3} = -8 = m \rightarrow y+6 = -8(x-0) \rightarrow y = -8x-6 \rightarrow 9y = -6 \rightarrow y = -\frac{2}{3} \rightarrow x = y = -\frac{2}{3} \quad (14) \quad (15)$$

$$m_1 = m_2 \rightarrow \frac{1}{a} = a \rightarrow a^2 = 1 \rightarrow a = \pm 1 \rightarrow \text{فقط در صورتی که } a = 1 \text{ باشد نقطه (2) فقط در خط } y = ax+1 \text{ می افتد} \quad (16) \quad (17)$$

$$\Rightarrow \text{مقادیر } \begin{cases} y = x+1 \\ y = x \end{cases} \rightarrow \begin{matrix} \Delta \\ \sqrt{2} \end{matrix} \Rightarrow \frac{|-1+2|}{\sqrt{2}} = \frac{\sqrt{2}}{2} \Rightarrow \sqrt{25 - \frac{2}{4}} = \sqrt{\frac{98-1}{2}} = \frac{\sqrt{97}}{\sqrt{2}} = \frac{\sqrt{194}}{2} \quad (18) \quad (19)$$

$$\rightarrow S = \frac{1}{\sqrt{2}} \times \frac{\sqrt{194}}{\sqrt{2}} = \boxed{\frac{\sqrt{194}}{2}} \quad (20) \quad (21)$$

۸) ایستایم که چون سوال گفته اگر طول ضلع 6 در جواب بدست بیاید (1) طول ضلع AH=BC و (2) طول ضلع AB=AC باشد طبق محاسبات مورد (1) مساحت نوزی

$$\overline{AB} = \overline{AH} = \frac{|4-0-1|}{\sqrt{1+9}} = \frac{3}{\sqrt{10}} = \frac{3\sqrt{10}}{10} \quad (22) \quad (23)$$

$$\overline{AC} = 4-1 = 3 \quad (24) \quad (25)$$

$$\Rightarrow \text{Max } S_{ABC} = \frac{9}{2\sqrt{10}} \times \frac{3\sqrt{10}}{10} = \frac{27}{20} = \boxed{1.35} \quad (26) \quad (27)$$

$$\frac{b-a}{\frac{-1}{\sqrt{3}} + \frac{1}{\sqrt{3}}} = \sqrt{3} \rightarrow b-a = \frac{\sqrt{3}}{\frac{1}{\sqrt{3}}} = 3$$

$$d_{AB} = \sqrt{\left(\frac{b-a}{\sqrt{3}}\right)^2 + \left(\frac{-1}{\sqrt{3}} + \frac{1}{\sqrt{3}}\right)^2} = \sqrt{\frac{3+1}{3}} = \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$$

نقطه $\frac{\sqrt{3}}{3}$ ✓

شیب $\frac{1}{\sqrt{3}}$ $\rightarrow$ Δ $\rightarrow m_M = \frac{0+1}{0+1} = \frac{1}{1} \rightarrow m_L = \frac{-1}{1}$

A: $\frac{1}{\sqrt{3}}$ 0%

$$L: y+1 = \frac{-1}{\sqrt{3}}(x+1) \rightarrow y = \frac{-1}{\sqrt{3}}x - \frac{1+1}{\sqrt{3}} \rightarrow y = \frac{-1}{\sqrt{3}}x - \frac{2}{\sqrt{3}} : L$$

$$M: \frac{y-0}{x-0} = \frac{1}{\sqrt{3}} \rightarrow y = \frac{1}{\sqrt{3}}x \text{ و } x = -1 \rightarrow M: y-1 = \frac{1}{\sqrt{3}}(x+1)$$

$$\rightarrow y = \frac{1}{\sqrt{3}}x + \frac{1+1}{\sqrt{3}} \rightarrow y = \frac{1}{\sqrt{3}}x + \frac{2}{\sqrt{3}} : M$$

$$\Rightarrow \begin{cases} y + \frac{1}{\sqrt{3}}x = \frac{-2}{\sqrt{3}} \\ y - \frac{1}{\sqrt{3}}x = \frac{2}{\sqrt{3}} \end{cases} \rightarrow \frac{2}{\sqrt{3}}x = \frac{-2-2}{\sqrt{3}} = \frac{-4}{\sqrt{3}} \rightarrow x = -1 \rightarrow y = -1 \rightarrow \text{جهت} = -1x - 1 = 1 \checkmark$$

خط عمود بر L $M = L$ (2)

نقطه روی خط M که مماس بر دایره است

باید دارای شیب $\frac{1}{\sqrt{3}}$ باشد و طول خط بین آن و نقطه (0,0) برابر 2 باشد پس شیب آن نقطه خط (0,0)

باید برابر m_L شود و چون در ناحیه دوم است پس x آن $-$ و y آن $+$ باشد پس:

ممنون از بررسی