

$$m_{AB} = -\frac{1}{r} = \frac{m-k}{r+r} = \frac{m-k}{r} \Rightarrow r(m-k) = -r \Rightarrow k-m=r$$

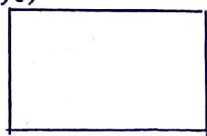
$$AB = \sqrt{(k-m)^2 + (-r-r)^2} = \sqrt{4r^2} = 2r$$

$$مساحت = \sqrt{4r^2} \times \sqrt{4r^2} = 4r^2$$

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$A(-1, 2)$

$B(3, 1)$



$$x_A + x_C = x_B + x_D \Rightarrow -1 + x = 3 + (1 - x) \Rightarrow -1 + x = 4 - x \Rightarrow x = \frac{5}{2}$$

$$m_{AB} \cdot m_{BC} = -1 \Rightarrow -\frac{r}{2} \times \frac{1-y}{3-m} = -1 \Rightarrow \frac{r}{2} \times \frac{1-y}{3-m} = 1 \Rightarrow \frac{1-y}{3-m} = \frac{2}{r} \Rightarrow m_{AB} = \frac{1-2}{3-(-1)} = -\frac{r}{4}$$

$D(-1-m, y+r)$

$C(2, y)$

$$AB = \sqrt{(2-(-1))^2 + (1-2)^2} = \sqrt{9+1} = \sqrt{10}$$

$D(-\frac{5}{2}, 2)$

$$AD = \sqrt{(2-(-1))^2 + (y-2)^2} = \sqrt{9 + \frac{9}{4}} = \frac{15}{2}$$

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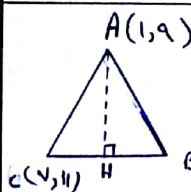
$$\tan 45^\circ = \sqrt{3}$$

$$r \tan \alpha + (n^2 - 1)y = r \Rightarrow (n^2 - 1)y = r - r \tan \alpha \Rightarrow y = \frac{-r \tan \alpha}{n^2 - 1} x + \frac{r}{n^2 - 1}$$

$$\frac{-r \tan \alpha}{n^2 - 1} = \sqrt{3} \Rightarrow \sqrt{3} = \frac{-r \tan \alpha}{n^2 - 1} \Rightarrow \sqrt{3} n^2 - r \tan \alpha = -r \Rightarrow \sqrt{3} n^2 + r \tan \alpha - r = 0$$

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$$|\alpha - \beta| = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{4 + (4\sqrt{3} + \sqrt{3})}}{\sqrt{3}} = \frac{\sqrt{4 + 5\sqrt{3}}}{\sqrt{3}} = \frac{\sqrt{14}}{\sqrt{3}} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$



$$m_{BC} = \frac{11-3}{3-1} = \frac{8}{2} = 4$$

$$y_{BC} \Rightarrow y - 3 = 4(x - 3) \Rightarrow y = 4x - 9$$

$$y = 4x - 9$$

$$\alpha_{AH} = \frac{|1 \cdot 9 - 2 + 3|}{\sqrt{1 + 4}} = \frac{11 \cdot 1}{\sqrt{5}} = \frac{11}{\sqrt{5}}$$

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$$BC: 2y - 3x = -19$$

$$AB: y + 3x = 5 \xrightarrow{x=2} -2y + 6 = -14 \Rightarrow -2y = -20 \Rightarrow y = 10$$

$$AC: 4y - 3x = 14$$

$$BH \text{ عمود } AC = AC \text{ عمود } AB$$

$$\rightarrow d = \frac{|-9 + 12 - 14|}{\sqrt{10}} = \frac{11}{\sqrt{10}} = \frac{11\sqrt{10}}{10}$$

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	$m_{\text{خط}} = \frac{-1-0}{0-(-\frac{1}{2})} = \frac{-1}{\frac{1}{2}} = -2 \quad y-0 = -2(x-(-\frac{1}{2})) \rightarrow$ $y_{\text{خط}} = -2x - 1$ $m_{\text{خط عمودي}} \rightarrow -2x - 1 = x \Rightarrow -3x = 1 \Rightarrow x = -\frac{1}{3} \Rightarrow M(-\frac{1}{3}, -\frac{1}{3})$ $\text{المسافة} = m_{\text{خط عمودي}} = \sqrt{(0-(-\frac{1}{3}))^2 + (0-(-\frac{1}{3}))^2} = \sqrt{\frac{1}{9} + \frac{1}{9}} = \sqrt{\frac{2}{9}} = \frac{\sqrt{2}}{3}$	6
	$(y-x)=1 \rightarrow y-x=1 \rightarrow y=x+1$ $ay-n=a-1 \rightarrow y=\frac{1}{a}x + \frac{a-1}{a}$ $\rightarrow a=-1 \rightarrow y=-x+1, y=-x+2 \rightarrow \text{خط عمودي (1,2)}$ $\rightarrow a=1 \rightarrow y=x+1, y=x \rightarrow d = \frac{ 1 }{\sqrt{1+1}} = \frac{1}{\sqrt{2}}$ $\frac{\sqrt{2}}{2} \rightarrow \omega^2 = x^2 + \frac{1}{2} \rightarrow x = \sqrt{\frac{1}{2}} \omega$ $\text{المسافة} = (\sqrt{\frac{1}{2}}, 0) (\frac{\sqrt{2}}{2}) = \sqrt{\frac{1}{2}} \omega = \boxed{\frac{1}{2}}$	7
	$B \rightarrow y=0 \quad x-3(0)=1 \Rightarrow x=1 \quad B(1,0)$ $\text{المسافة} = \frac{ 1-0-1 }{\sqrt{1+9}} = \frac{0}{\sqrt{10}} = 0$ $m_{AC} = -1 \rightarrow m_{AC} = -3 \quad y-0 = -3(x-1) \rightarrow y_{AC} = -3x+3$ $C \rightarrow \text{خط عمودي} \Rightarrow -3x+3 = \frac{1}{3}x - \frac{1}{3} \Rightarrow -3x - \frac{1}{3}x = -\frac{1}{3} - 3 \Rightarrow -\frac{10}{3}x = -\frac{10}{3} \Rightarrow x=1, y=0 \quad C(1,0)$ $BC = \sqrt{(1-1)^2 + (0-0)^2} = 0$ $\text{المسافة} = \frac{1}{\sqrt{10}} \times \frac{1}{10} \times \frac{1}{10} = \frac{1}{100} = \boxed{\frac{1}{100}}$	8
	$m = \frac{b-a}{-\frac{1}{4} - (-\frac{1}{4})} = \frac{b-a}{0} = \text{undefined}$ $\text{المسافة} = \sqrt{(b-a)^2 + (-\frac{1}{4} + \frac{1}{4})^2} = \sqrt{\frac{1}{16} + \frac{1}{16}} = \sqrt{\frac{2}{16}} = \frac{\sqrt{2}}{4}$ $\text{المسافة} = a\sqrt{2} = \frac{1}{4} \times \sqrt{2} = \frac{\sqrt{2}}{4}$	9
	$(-1, -1) \rightarrow \text{المسافة} = \sqrt{(0-(-1))^2 + (0-(-1))^2} = \sqrt{1+1} = \sqrt{2} = 2$ $m_{L'} = \frac{0+1}{0+1} = 1 \quad y_L \Rightarrow y+1 = -\frac{1}{2}(x+1) \rightarrow y+1 = -\frac{1}{2}x - \frac{1}{2} \Rightarrow y = -\frac{1}{2}x - \frac{3}{2}$ $y_{L'} = \frac{1}{2}x + \frac{3}{2}$ $\text{المسافة} = \frac{1}{2}x + \frac{3}{2} = -\frac{1}{2}x - \frac{3}{2} \Rightarrow x = -3, y = 0$ $14m + 100 = -9m - 10 \Rightarrow 23m = -110 \Rightarrow m = -\frac{110}{23}$ $y = \frac{1}{2}(-3) + \frac{3}{2} = 0 \quad xy = (-3)(0) = 0$	10