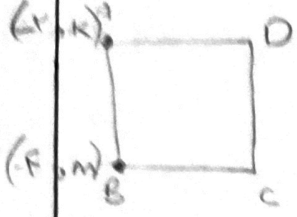
نام و نام خانوادگی: بهنیا رجبی

(19)

1

$\frac{k-m}{-2-4} = \frac{1}{2} \Rightarrow \frac{k-m}{-6} = \frac{1}{2} \Rightarrow \boxed{k-m=3}$

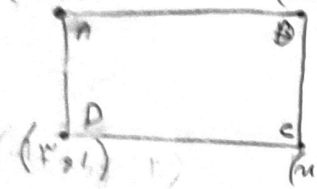
(2)



$\longrightarrow AB = \sqrt{(-4)^2 + (k-m)^2} = \sqrt{16+9} = \sqrt{25}$

$S_{مربع} = (\sqrt{25})^2 = 25$

2



$m_{AB} = -\frac{3}{4} \Rightarrow m_{AB} \perp m_{BC} \Rightarrow \frac{4}{3}$ (2)

$-1+x = 3-1-x \Rightarrow x = 3$

$m_{DC} \Rightarrow \frac{y-1}{x-3} = \frac{-3}{4} \Rightarrow \frac{y-1}{\frac{3}{2}} = -\frac{3}{4}$

$-2(y-1) = 4 \Rightarrow y = -1$

$\sqrt{4+\frac{9}{4}} = BC = \frac{5}{2}$

$\sqrt{16+9} = AB = 5$

$\Big\} \xrightarrow{\text{فیثاغورس}} \left(\frac{5}{2}+5\right)^2 = \boxed{\frac{15}{2}}$

3

$2mx + (m^2-1)y = 2 \Rightarrow 2mx - 2 = (1-m^2)y$

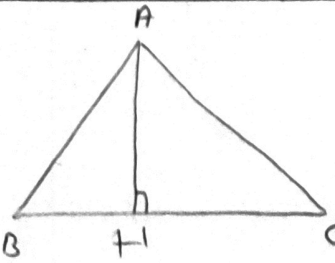
$\Rightarrow \tan 60^\circ = \sqrt{3} \Rightarrow \frac{2m}{1-m^2} = \sqrt{3} \Rightarrow 2m = \sqrt{3} - \sqrt{3}m^2$ (2)

$\Rightarrow \sqrt{3}m^2 + 2m - \sqrt{3} = 0 \Rightarrow \Delta = 4 - 4(\sqrt{3})(-\sqrt{3}) = 16$

$\Rightarrow x_1 = \frac{-2+4}{2\sqrt{3}} = \frac{\sqrt{3}}{3}$ $\quad x_2 = \frac{-2-4}{2\sqrt{3}} = \frac{-3}{\sqrt{3}} = \frac{-3\sqrt{3}}{3} = -\sqrt{3}$

اضلاع $= \frac{\sqrt{3}}{3} + \frac{3\sqrt{3}}{3} = \boxed{\frac{4\sqrt{3}}{3}}$

4



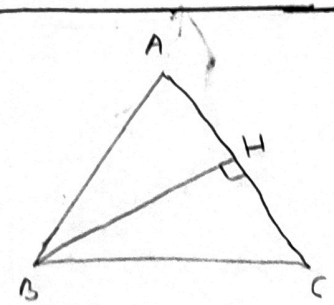
BC عمودمنصف $\Rightarrow m_{BC} = \frac{11-3}{7-3} = \frac{8}{4} = 2$ $\quad (3,3)$

$3 = 2(3) + b$

$y = 2x - 3 \rightarrow y - 2x + 3 = 0$

$A(1,9)$ $\quad AH = \frac{|9-2+3|}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5}$ (2)

5



$AB: y = -2x + 7$

$AC: 4y = 3x + 17$

$BC: 2y = 7x - 19$

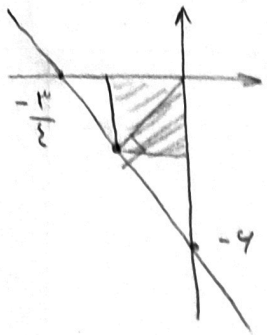
B محل برخورد $\begin{cases} 2y + 3x = 17 \\ 2y - 7x = -19 \end{cases}$

$11x = 33 \rightarrow \begin{matrix} x=3 \\ y=1 \end{matrix}$ (2)

$BH = \frac{|6-9-17|}{\sqrt{20}} = \frac{20}{5} = 4$

$2y - 4x - 17 = 0$

6



$a = \frac{-4}{\frac{1}{2}} = -8 \Rightarrow y = -8x - 4$

$(-\frac{1}{2}, 0)$

$(0, -4)$ $\Rightarrow$ $y = 8x + 4$

$\Rightarrow x = -8x - 4 \rightarrow 9x = -4 \rightarrow x = -\frac{4}{9}$

$y = -\frac{8}{9}$

$\Rightarrow$ فصر $\rightarrow \frac{4\sqrt{2}}{9}$

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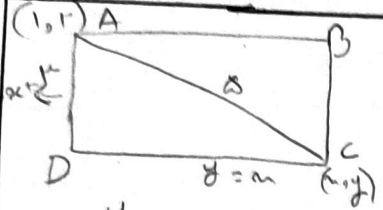
7



$ay - x = a - 1$, $y - ax = 1$

$\downarrow$ $\downarrow$

$y = \frac{1}{a}x + \frac{a-1}{a}$ $y = ax + 1$

$\rightarrow y = x + 1$

$\rightarrow y = x$

$\Rightarrow$ سطح $= \frac{1}{\sqrt{2}} \times \frac{4}{\sqrt{2}} = \frac{4}{2} = 2$

$\frac{|0-1|}{\sqrt{(-1)^2+(1)^2}} = \frac{1}{\sqrt{2}}$

$\Rightarrow a = \frac{1}{a} \Rightarrow a = \pm 1$

$a = -1$ غ ق ق

$a = +1$ ق ق

$\frac{1}{2} = \frac{1}{2} + x^2 \Rightarrow x = \frac{1}{\sqrt{2}}$

(۲)

8

$x - 3y - 1 = 0$

$\Rightarrow AH = \frac{|3 - 0 - 1|}{\sqrt{1+9}} = \frac{2}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} = \frac{2\sqrt{10}}{10}$

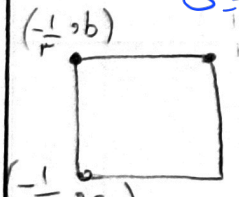
(۱)

$S = \frac{\frac{2\sqrt{10}}{10} \times \frac{4\sqrt{10}}{10}}{2} = \frac{8}{20}$

$AB^2 = AH^2 + BH^2 \rightarrow 4^2 = \left[\frac{2}{\sqrt{10}}\right]^2 + BH^2 \rightarrow BH = \frac{9}{\sqrt{10}}$

$S = \frac{2}{\sqrt{10}} \times \frac{9}{\sqrt{10}} \times \frac{1}{2} = \frac{18}{40}$

9



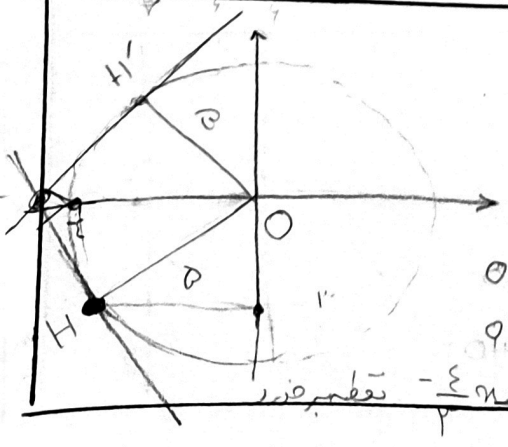
$a = \frac{b-a}{-\frac{1}{2}+\frac{1}{2}} = \frac{b-a}{+1} = \sqrt{2} \Rightarrow b - a = \frac{\sqrt{2}}{2}$

(۲)

$\sqrt{\left(\frac{1}{2}\right)^2 + (b-a)^2} = \sqrt{\frac{1}{4} + \left(\frac{\sqrt{2}}{2}\right)^2} = \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{2}$

$\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2 = (\text{وتر})^2 \Rightarrow$ وتر $= \frac{1}{2}\sqrt{2}$

10



$OH = \sqrt{(0-3)^2 + (-2-2)^2} = \boxed{5}$

(۲)

$OH = OH' = d = \sqrt{(x-0)^2 + (y-0)^2}$

$d^2 = (y-0)^2 + (x-0)^2$

$(y = 3)$ ، $(x = -3)$

$\boxed{\lambda = (-3)(-\lambda)} \Leftarrow D(-\lambda, -3)$ نقطه برخورد

$\frac{3}{4}x + 3 = \frac{5}{4}x - 3 \Rightarrow \frac{5}{4}x - \frac{3}{4}x = 3 + 3$

$y = \frac{3}{4}x + 3$: معادله HD

$y = \frac{5}{4}x - 3$: معادله HO