

مسئله یازدهم گروه A

نام و نام خانوادگی: غزل عباسی تکلیف شماره ۱۷

۱

$$q = \frac{\Delta y}{\Delta n} = \frac{-1}{1} = \frac{k-m}{-1-1} \Rightarrow k-m=1 \quad S=(AB)^2 \Rightarrow$$

$$AB = \sqrt{(k-m)^2 + (-1-1)^2} = \sqrt{1^2 + 4^2} \quad S = (AB)^2 = 1 + 4 = 5$$

$$n_A + n_C = n_B + n_D \Rightarrow -1 + n = 1 + (-1) - n \Rightarrow 2n = 1 \quad n = \frac{1}{2}$$

$$y_A + y_C = y_B + y_D \Rightarrow 1 + y = 1 + y + 1 \Rightarrow \times$$

$$AB = B - A = (1, -1) \quad CD = D - C = (-1, 2n) \quad \vec{CD} \perp \vec{AB} \Rightarrow \text{هم‌راستا یا متعامد}$$

$$AB, BC \Rightarrow \text{موازی} \quad AB \times BC = 0 \Rightarrow y+1=0 \Rightarrow y=-1$$

$$AB \text{ طول} = \sqrt{1+1} = \sqrt{2} \quad BC \text{ طول} = \sqrt{(-1)^2 + (-1/2)^2} = \sqrt{5/4} = \sqrt{5}/2$$

$$\rho = 2 \times (\sqrt{2} + \sqrt{5}/2) = \boxed{2\sqrt{2} + \sqrt{5}}$$

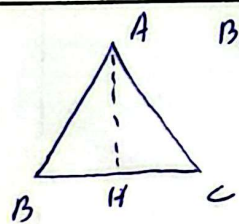
۲

$$m = \sqrt{2} < \tan 45^\circ \quad \frac{-2m}{m^2-1} = \sqrt{2} \Rightarrow \sqrt{2}m^2 + 2m - \sqrt{2} = 0$$

$$n_1, n_2 \Rightarrow \frac{-b \pm \sqrt{\Delta}}{2a} \Rightarrow \Delta = 4 + 12 = 16 \Rightarrow \frac{-2 \pm 4}{2\sqrt{2}} \Rightarrow n_1 = \frac{-2+4}{2\sqrt{2}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$n_2 = \frac{-2-4}{2\sqrt{2}} = -\frac{3}{\sqrt{2}} = -\frac{3\sqrt{2}}{2}$$

۳

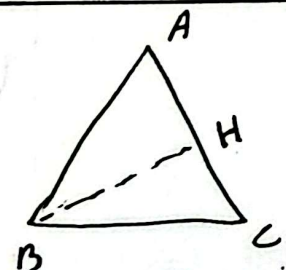


$$BC \text{ موازی} \Rightarrow M_{BC} = \frac{11-1}{1-1} = \frac{1}{1} = 1 \quad B(1,1) \quad y-1 = 1(x-1)$$

$$y = 2x - 1$$

$$d = \frac{|ax+by+c|}{\sqrt{a^2+b^2}} = \frac{|-1+9+1|}{\sqrt{1+1}} = \frac{9}{\sqrt{2}} = \frac{9\sqrt{2}}{2}$$

۴



B موازی

$$y + 2x - 1 = 1(x - 1) + 1 \Rightarrow 11x = 2 \Rightarrow x = \frac{2}{11}$$

BC, AB

$$x + 2y - 1 = 1(x - 1) + 1$$

B(1,1)

$$y = 1$$

$$d = \frac{|1 - 9 - 1|}{\sqrt{1+4}} = \frac{9}{\sqrt{5}} = \frac{9\sqrt{5}}{5}$$

۵

$$\text{فاصله خط: } m = \frac{4}{-2} = -2 \xrightarrow{(0, -4)} y + 4 = -2(n) \Rightarrow y = -2n - 4$$

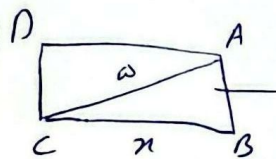
$$\left(0, -4\right), \left(-\frac{2}{1}, 0\right) \xrightarrow{\text{فاصله از مبدأ}} \Rightarrow \frac{|-4|}{\sqrt{1^2 + (-2)^2}} = \frac{4}{\sqrt{5}} = \frac{4\sqrt{5}}{5}$$

$$\text{دو خط موازی} \Rightarrow y - an - 1 = 0 \Rightarrow m_1 = m_2 \Rightarrow a = \frac{1}{a} \Rightarrow a = \pm 1$$

$$\text{اگر } a = 1 \Rightarrow y - n - 1 = 0 \xrightarrow{(1, 2)} \text{رکاب صورت می‌دهد} \quad y - n = 0 \xrightarrow{(1, 2)} \text{رکاب صورت نمی‌دهد}$$

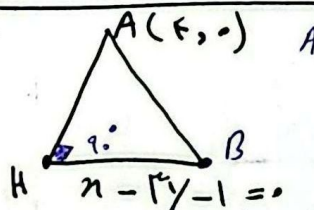
$$\text{فاصله خط از خط} \Rightarrow (1, 2), y - n = 0 \Rightarrow \frac{|1 - 2|}{\sqrt{1^2 + (-1)^2}} = \frac{1}{\sqrt{2}}$$

$$\text{اگر } a = -1 \Rightarrow y + n - 1 = 0 \xrightarrow{(1, 2)} \times \quad y - n = 0 \xrightarrow{(1, 2)} \times \quad \text{غیر قابل تبدیل}$$



$$r^2 = \left(\frac{1}{\sqrt{2}}\right)^2 + n^2 \Rightarrow 10 - \frac{1}{2} = n^2 \Rightarrow n = \frac{\sqrt{19}}{2}$$

$$S = \frac{1}{\sqrt{2}} \times \frac{\sqrt{19}}{2} = \frac{\sqrt{19}}{2}$$



$$AH = \frac{|4 - 0|}{\sqrt{1^2 + 1^2}} = \frac{4}{\sqrt{2}} \Rightarrow \text{مساحت قائم الزامی}$$

$$S = (BH)(AH) \times \frac{1}{2} \Rightarrow n_B y_B > 0$$

$$\text{بزرگترین حالت باشد که } n = 0, \text{ و } y \text{ نزدیک به منفی شود (ا.د.)}$$

$$AB = \frac{4}{\sqrt{2}} \Rightarrow S_{\max} = \frac{4}{\sqrt{2}} \times \frac{4}{\sqrt{2}} \times \frac{1}{2} = \frac{8}{2} = 4$$

$$M = \sqrt{2} = \frac{a - b}{\frac{-1}{2} - (-\frac{1}{2})} \Rightarrow a - b = \frac{\sqrt{2}}{2} \quad AB = \sqrt{\left(\frac{\sqrt{2}}{2}\right)^2 + \frac{1}{4a}} = \frac{1}{2} = \frac{2}{4}$$

$$S = \frac{2}{4} \times \frac{2}{4} = \frac{1}{4} \times \frac{1}{4} = \frac{1}{16} = n^2 \Rightarrow n = \frac{1}{4} = \frac{\sqrt{2}}{4}$$

$$p(-2, -4) \Rightarrow m_{op} = \frac{2}{1}$$

$$m_L = \frac{-2}{1} \xrightarrow{\text{مماس}} y = \frac{-2}{1}n - \frac{20}{1}$$

$$L_r \text{ مماس} = y = \frac{2}{1}n + c$$

$$L_r \Rightarrow \frac{|c|}{\sqrt{1 + \left(\frac{2}{1}\right)^2}} = \frac{20}{5} \Rightarrow |c| = \frac{20}{1} = 20$$

$$\begin{cases} y = \frac{-2}{1}n - \frac{20}{1} \\ y = \frac{2}{1}n + \frac{20}{1} \end{cases} \Rightarrow n = -1 \quad y = 1$$

$$\times 12 \Rightarrow 12y = -14n - 100$$

$$12y = 9n + 100$$

$$\Rightarrow -20n = +100 \Rightarrow n = -5$$

$$y = +1$$

$$(-5) \times (+1) = -5$$