

۱۸

تاریخ شماره ۱۷

بزرگوار است

اصول هندسه

Year: Month: Date: ()

$$\overline{AB} \rightarrow m = \frac{\Delta y}{\Delta x} = \frac{1 - (-2)}{2 - 1} = \frac{12}{-1} = -12 \rightarrow y = -12x + 14$$

(۲)

B و A نقطه وسط (۳، ۱)

$$\rightarrow \overline{AB} \text{ عمود بر } \overline{BC} \rightarrow m' = \frac{1}{-12} \rightarrow y = \frac{1}{-12}x + \frac{1}{12} \rightarrow \boxed{12y - x - 1 = 0} \checkmark$$

A(۳، ۱) / B(-۱، ۷) / C(-۷، ۳)

$$BC \text{ دایره} = \sqrt{(3)^2 + (1)^2} \rightarrow \boxed{\Delta = BC} \checkmark$$

(۳)

$$AH \perp BC \rightarrow BC \text{ دایره} \rightarrow m_{BC} = \frac{7 - 3}{-1 - 7} = \frac{4}{-8} = -\frac{1}{2} \rightarrow BC \rightarrow y = -\frac{1}{2}x + \frac{5}{2}$$

$$AH \perp BC \rightarrow m_{AH} = \frac{2}{1} \rightarrow y = \frac{2}{1}x + \frac{5}{2} \rightarrow H \text{ نقطه تقاطع } AH = BC$$

$$AH = BC \rightarrow -\frac{1}{2}x + \frac{5}{2} = \frac{2}{1}x + \frac{5}{2} \rightarrow \left(\frac{1}{2} + \frac{2}{1}\right)x = \frac{5}{2} - \frac{5}{2} \rightarrow \frac{5}{2}x = 0 \rightarrow x = 0$$

$$1 - \left(\frac{1}{2}, \frac{5}{2}\right) \leftarrow \begin{cases} 2\Delta x = 3\Delta y \rightarrow m = \frac{3\Delta y}{2\Delta x} = \frac{3}{2} \end{cases} \rightarrow y = \frac{3}{2}x + \frac{5}{2}$$

$$\rightarrow AH \rightarrow \left\{ A(3, 1) \right. \\ \left. H\left(\frac{1}{2}, \frac{5}{2}\right) \right\} \rightarrow \sqrt{\left(\frac{1}{2} - 3\right)^2 + \left(\frac{5}{2} - 1\right)^2} = \sqrt{\frac{50}{4} + \frac{16}{4}} = \sqrt{\frac{66}{4}} = \sqrt{\frac{33}{2}} = \boxed{AH} \checkmark$$

$$\rightarrow |BC| - |AH| = 5 - 2 = 3 \leftarrow \text{جواب} \checkmark$$

$$\begin{cases} 4y - ax - 2 = 0 \\ 2y - x - 1 = 0 \end{cases} \rightarrow \begin{cases} 4y - ax - 2 = 0 \\ 4y - 2x - 2 = 0 \end{cases} \rightarrow a = 2$$

(۲)

$$\rightarrow 4y - ax - 2 = 0 \rightarrow 4y - 2x - 2 = 0 \rightarrow 2y - x - 1 = 0$$

$$\rightarrow d = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{|-2 - (-12)|}{\sqrt{1 + 4}} = \frac{10}{\sqrt{5}} = \frac{10}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5}$$

$$\rightarrow r = d = \frac{4\sqrt{5}}{5} \rightarrow r = \frac{4\sqrt{5}}{5} \rightarrow S = \pi r^2 = \boxed{\frac{16\pi}{5}} \checkmark$$

Year. Month. Date. ()

$$A(2,3)/B(4,1)/C(-1,-2)$$

(۴)

$$M \rightarrow AB \text{ کا وسط } \rightarrow M(3,2)$$

(۲)

$$AB \text{ کی شیب } \rightarrow m_{AB} = \frac{3-1}{2-4} = \frac{2}{-2} = -1 \rightarrow y = -x + 5 \rightarrow \text{AH کا شیب } \rightarrow y = x + 2$$

$$\rightarrow H \rightarrow AB, \text{ AH کا شیب } \rightarrow x+2 = -x+5 \rightarrow 2x = 3 \rightarrow x = \frac{3}{2}, y = \frac{7}{2}$$

$$\rightarrow M(3,2), H(\frac{3}{2}, \frac{7}{2}) \rightarrow \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{1}{2}\right)^2} = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} = MH \rightarrow MH = \frac{\sqrt{2}}{2} \checkmark$$

A (3, 2) H (3/2, 7/2)

$$(3m-2)x + (8-m)y - 1 = 0 \quad (m-1)x - (2m-4)y + 1 = 0 \rightarrow m = \frac{m-1}{-(2m-4)} \quad (5)$$

(۱۵)

$$\rightarrow \frac{-3m+2}{5-m} = \frac{-m+1}{-2m+4} \rightarrow \frac{-3m+2}{5-m} = \frac{-3m+2}{5-m} \rightarrow -3m+2 = -3m+2 \rightarrow 9m+m^2-11=0 \rightarrow m = \frac{-3 \pm \sqrt{5}}{2}$$

نوٹ: ۱-۵

$$2m^2 - 13m + 11 = 0 \rightarrow m = \frac{13 \pm \sqrt{5}}{4}$$

$$\begin{cases} AB: x+2y=5 \rightarrow 2y = -x+5 \rightarrow y = -\frac{1}{2}x + \frac{5}{2} \\ AC: y=2x-1 \rightarrow y = 2x-1 \\ BC: m+x=4 \rightarrow y = -x+4 \end{cases} \quad (2)$$

$$AB \cap BC \rightarrow \frac{1}{2}x + \frac{5}{2} = -x + 4 \rightarrow \frac{3}{2}x = \frac{3}{2} \rightarrow x = 1 \rightarrow y = 3 \rightarrow B(1,3) \checkmark$$

$$AC \cap BC \rightarrow 2x-1 = -x+4 \rightarrow 3x = 5 \rightarrow x = \frac{5}{3} \rightarrow y = \frac{1}{3} \rightarrow C(\frac{5}{3}, \frac{1}{3}) \checkmark$$

$$\rightarrow M = (\frac{10}{3}, \frac{4}{3}) \rightarrow AC \perp AB \text{ پر } \rightarrow \frac{1}{2}x + \frac{5}{2} = -x + 4 \rightarrow x = 1 \rightarrow y = 3 \rightarrow A(1,3) \checkmark$$

$$\rightarrow x_A = 1, y_A = 3 \rightarrow A(1,3) \checkmark, AH \perp BC \rightarrow AH \rightarrow y = x+2$$

$$\rightarrow AM = \sqrt{\left(\frac{10}{3}-1\right)^2 + \left(\frac{4}{3}-3\right)^2} = \sqrt{\frac{49}{9} + \frac{25}{9}} = \sqrt{\frac{74}{9}} = \frac{\sqrt{74}}{3}$$

$$x = -x+5 \rightarrow x = 2, y = 2$$

$$H(2,2)$$

$$\rightarrow AH = \sqrt{1^2 + 1^2} = \sqrt{2} \rightarrow \frac{AM}{AH} = \frac{\frac{\sqrt{74}}{3}}{\sqrt{2}} = \frac{\sqrt{74}}{3\sqrt{2}} = \frac{\sqrt{37}}{3} \checkmark$$

Year: Month: Date: ()

$$m = -\frac{1}{4} \text{ و } (a_0, b_0) \rightarrow \frac{y}{b} + \frac{x}{a} = 1$$

(۷) (۲)

$$\frac{|ab|}{\sqrt{a^2+b^2}} = \frac{|a \times \frac{a}{r}|}{\sqrt{a^2 + \frac{a^2}{r^2}}} = \frac{\frac{a^2}{r}}{\sqrt{\frac{a^2(r^2+1)}{r^2}}} = \frac{\frac{a^2}{r}}{\frac{a\sqrt{r^2+1}}{r}} \rightarrow \frac{|a|}{\sqrt{5}} = \sqrt{2} \rightarrow |a| = 10$$

$$\rightarrow a = \pm 10 \rightarrow b = \pm 5 \rightarrow \sqrt{(10-0)^2 + (0-5)^2} = \sqrt{125} = 5\sqrt{5} \leftarrow \text{جواب}$$

معادله: $m = 3$

معادله: $\Delta > 0 \rightarrow \frac{c}{a} = -1$

حاصل ضرب مقادیر $m = -3$

$$\begin{cases} y + m \cdot m - m - 2 = m \cdot y - \epsilon \cdot m - 2m \\ y + m \cdot m - m - 2 = y - m \\ m \cdot y - \epsilon \cdot m - 2m = y - m \end{cases}$$

$$\text{حل اول} \rightarrow \left| \frac{m}{r} - \frac{2}{1-m} \right| = \frac{\Delta}{r}$$

یک از جواب ها

$$m = -2 \pm \sqrt{5}$$

$$(-2-\sqrt{5})(-2+\sqrt{5}) = \epsilon - \delta$$

$$m' = 2a - m \text{ و } y' = 2b - y \rightarrow a = 2, b = -2 \rightarrow m' = \epsilon - m, y' = -\epsilon - y$$

$$y = m^2 - 2 \rightarrow (-\epsilon - y') = 2(\epsilon - m') - 2 \rightarrow y' = 2m' - 4 \rightarrow y = 2m - 4$$

$$y - 2 = -1(m - 1) \rightarrow y = -m + 3$$

$$m + 0 = -m + 3 \rightarrow 2m = 3 \rightarrow m = -1 \rightarrow y = -1 + 0 = \epsilon \rightarrow (-1, \epsilon)$$

$$\rightarrow \frac{1+a}{r} = -1 \rightarrow a = -3 \text{ و } \frac{2+b}{r} = \epsilon \rightarrow 2+b = 11 \rightarrow b = 9$$

$$\rightarrow a = -3, b = 9 \rightarrow 2b - a = 12 + 3 = 15$$