۱)

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

$m - 4 = -3$

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

$S = d^2 = (\sqrt{25})^2 = 25$ ✓ (۲)

۴)

$d = \sqrt{(-1-1)^2 + (4-1)^2} = \sqrt{4+9} = \sqrt{13}$ ✓

$m = m'$

$\frac{y+2}{-6} = \frac{4}{-2} = \frac{-4}{-1-3}$

$-1-3x = -4$

$-3x = -3$

$x = \frac{3}{3} = 1$

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

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

$S = \frac{1}{2}(|AB| \times |BC|) = \frac{1}{2} \times 5 \times \frac{5}{2} = \frac{25}{4}$ ✓ (۲)

$AB \perp BC$

$m_{AB} \cdot m_{BC} = -1$

$\frac{4}{-3} \times m_{BC} = -1$

$m_{BC} = \frac{3}{4}$

$\frac{y-1}{-2} = \frac{3}{4}$

$y - 1 = -\frac{3}{2}$

$y = -\frac{1}{2}$

۳-

$2mx + (m^2-1)y = 3$

$m = \frac{-2m}{m^2-1}$

$\sqrt{3} = \frac{-2m}{m^2-1}$

$\sqrt{3}m^2 - \sqrt{3} = -2m$

$\sqrt{3}m^2 + 2m - \sqrt{3} = 0$

$\frac{-2 \pm \sqrt{4+3}}{2\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\frac{-3}{\sqrt{3}}$

$\frac{1}{\sqrt{3}} + \frac{3}{\sqrt{3}} = \frac{4}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$ ✓ (۲)

۴-

$\frac{\Delta y}{\Delta x} = \frac{8}{4} = 2$

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

$\frac{|9 - 2 + 3|}{\sqrt{1+4}} = \frac{10}{\sqrt{5}} = \frac{10\sqrt{5}}{5} = 2\sqrt{5}$ ✓ (۲)

۵-

$\begin{cases} y + 2x = 7 \\ 2y - 7x = -19 \end{cases}$

$2y + 4x = 14$

$11x = 33$

$x = \frac{33}{11} = 3$

$y = \frac{7}{4}$

$B = (3, 1)$

$\frac{|4(1) - 3(3) - 12|}{\sqrt{3^2+4^2}} = \frac{|4 - 9 - 12|}{5} = \frac{22}{5}$ ✓ (۲)

۶-

$\begin{cases} -4x - y = 6 \\ y - x = 0 \end{cases}$

$-5x = 6$

$x = -\frac{6}{5}$

$y = -\frac{6}{5}$

$\sqrt{\left(\frac{6}{5}\right)^2 + \left(\frac{6}{5}\right)^2} = \frac{\sqrt{8}}{3}$

$\frac{6}{5} + \frac{6}{5} = \frac{12}{5}$

$\frac{2\sqrt{2}}{3}$ ✓ (۲)

$\frac{x}{-3} + \frac{y}{-6} = 1$

$-6x - 3y = 18$

$-3y = 6x + 18$

$y = -2x - 6$

$(0, -6)$

$(-3, 0)$

-۷ (۲)

$m = m'$

$y = ax + 1$ ⟨ $y = x + 1$ ، $y = -x + 1$ ی‌ی

$m = a$

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

$a = \pm 1$

$y = \frac{1}{a}x + a - 1$ ⟨ $y = a$ ، $y = -x - 2$ ی‌ی

$m' = \frac{1}{a}$

$\frac{1}{\sqrt{1+1}} = \frac{\sqrt{2}}{2}$

$\sqrt{(\frac{\sqrt{2}}{2})^2 + x'^2} = 1$

$\frac{1}{2}$

$x' = 2,0.8 = x' : \frac{4.9}{2}$

$x = \frac{\sqrt{2}}{\sqrt{5}} = \frac{\sqrt{10}}{2}$

$(2,0) = \frac{\sqrt{2}}{2} \times \frac{\sqrt{4}}{2}$ ✓

-۸ (۲)

$x - 2y - 1 = 0$

$y = \frac{1}{2}x - \frac{1}{2}$

$\frac{|1(1) - 2(0) - 1|}{\sqrt{1+4}} = \frac{2}{\sqrt{5}}$

$\lambda = \frac{4}{\sqrt{10}}$

$(\frac{2}{\sqrt{10}})^2 + x^2 = 4$

$x^2 = 1,6 = \frac{16}{10}$ $\frac{4}{10} + x^2 = 4$

$x = \frac{\sqrt{6}}{\sqrt{10}}$

$(1,0) =$ نقطه سوم

$\frac{1}{2} + \frac{4}{5} \times \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$ ✓

-۹ (۲)

$\frac{\Delta y}{\Delta x} = \sqrt{2}$

$\frac{b-4}{-\frac{1}{2}+\frac{1}{2}} = \frac{b-a}{\frac{1}{6}} = \sqrt{2}$

$b - a = \frac{\sqrt{2}}{6}$

$\sqrt{(\frac{1}{6})^2 + (\frac{\sqrt{2}}{6})^2} = \frac{1}{2}$

$\frac{1}{36} + \frac{2}{36} = \frac{3}{36} = \frac{1}{12}$

$S = \frac{1}{2} \times \frac{1}{12} = \frac{1}{24}$

$\sqrt{(\frac{1}{6})^2 + (\frac{1}{6})^2} = \sqrt{\frac{2}{9}} = \frac{\sqrt{2}}{3}$ ✓

$S = \frac{\pi^2}{2} = \frac{1}{9}$

$\pi^2 = \frac{2}{9}$

$x = \frac{1}{\sqrt{18}} = \frac{\sqrt{18}}{18} = \frac{\sqrt{2}}{6}$

-۱۰ (۲)

$r = \sqrt{(-2-0)^2 + (2-0)^2} = d$

$y = \frac{3}{4}x + \frac{15}{4}$

$d \parallel d'$

$\frac{|b|}{\frac{5}{3}} = d = d' : 3x + 4y + b$

$m_{AB} = \frac{0-(-3)}{0-(-4)} = \frac{3}{4}$

$m_{d'} = \frac{3}{4}$

$|b| = \frac{25}{3} \Rightarrow \begin{cases} b = \frac{25}{3} \\ b = -\frac{25}{3} \end{cases}$ ی‌ی

d' با y ⟹ $b = \frac{25}{3}$

$\frac{25}{4} + \frac{3}{4}x = -\frac{3}{4}x - \frac{25}{4}$

$\frac{25}{2}x = -\frac{100}{4} = -25$ ⟹ $x = -2$, $y = -1$ ✓

$a : y = (-1) + (-2) = -3$ ✓