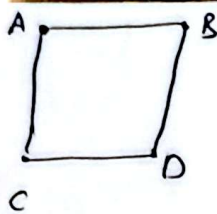


$A(1, -k)$
 $B(1, m)$



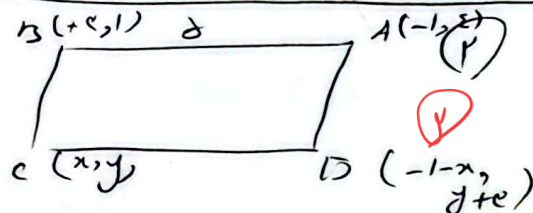
$\frac{m-k}{1-(-1)} = -\frac{1}{2} \Rightarrow m = k-m$

$AB = (1-(-1), m-k) = (2, -k)$

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

$(\sqrt{4+k^2})^2 = 4+k^2$

$A(-1, k)/B(1, 1)/C(x, y), D(-1-x, y+k)$



$x_B + x_D = x_A + x_C \Rightarrow 1-x = -1+x \Rightarrow x = 1$

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

$1(1) + k = 1 + k$

$m_{AB} = -\frac{k}{2} \Rightarrow m_{BC} = \frac{2}{k} = \frac{y-1}{x-1} \Rightarrow y = -k$

$2mx + (m^2-1)y = k \Rightarrow 2mx + (m^2-1)y - k = 0$

$\tan 45^\circ = \sqrt{2}$

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

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

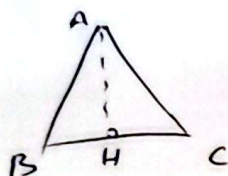
$I \frac{-1+\sqrt{2}}{2\sqrt{2}} = \frac{1}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{1}{2} = \frac{\sqrt{2}}{2}$

$II \frac{-1-\sqrt{2}}{2\sqrt{2}} = \frac{-1}{2\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = -\frac{1}{2} = -\frac{\sqrt{2}}{2}$

$\frac{\sqrt{2}}{2} - \sqrt{2} = \frac{\sqrt{2}}{2} - \frac{2\sqrt{2}}{2} = -\frac{\sqrt{2}}{2}$

$A(1, 9)/B(2, 2)/C(5, 11)$

$m_{BC} = \frac{11-2}{5-2} = 3 \Rightarrow y-2 = 3(x-2)$



$BC \perp AD \Rightarrow y - 2x + 4 = 0$

$|ax + by + c| = \frac{|9-2+4|}{\sqrt{1+4}} = \frac{11}{\sqrt{5}} = 2\sqrt{5}$

$AB: y - 2x = 7$

$AC: y - 2x = 10$

$BC: y - 2x = -14$

$AC, AB \Rightarrow y = 10 - 2x \Rightarrow \frac{10-2x}{2} = 7 - 2x \Rightarrow y = 10, x = 1$

$BC, AB \Rightarrow y = 10 - 2x \Rightarrow y = 10, x = 1 \Rightarrow B(2, 2)$

$BC, AC \Rightarrow \frac{10-2x}{2} - 2x = -14 \Rightarrow y = 10, x = 5 \Rightarrow C(5, 11)$

$AC \Rightarrow y - 2x - 10 = 0$

$d = \frac{|ax + by + c|}{\sqrt{a^2 + b^2}} = \frac{|1(1) - 2(2) - 10|}{\sqrt{1+4}} = \frac{11}{\sqrt{5}} = 2\sqrt{5}$



$$(-\frac{3}{2}, 0)(0, -4) \rightarrow \frac{y}{-1} = \frac{-x-4}{-1} \Rightarrow y = x+4$$

$$y = -x^2 - 4$$

$$y = \frac{1}{4}x - \frac{1}{4}$$

$$(-\frac{3}{2}, 0)(0, -4) \rightarrow \frac{y}{-1} = \frac{-x-4}{-1} \Rightarrow y = x+4$$

$$a = -1, a-4 = -4 \Rightarrow a = -\frac{1}{4}$$

$$\sqrt{2x \frac{1}{4}} \Rightarrow \sqrt{\frac{1}{2}} \rightarrow \frac{\sqrt{1}}{\sqrt{2}}$$

$y - ax = 1, ay - x = a - 1 \rightarrow y = ax + 1, ay - x = a - 1 \Rightarrow$
 $\frac{1}{a} = a \Rightarrow a = \pm 1$
 $a = -1$
 $y - (-1)x = 1 \Rightarrow y + x = 1$
 $-1(y - x) = -1 - 1 \Rightarrow x + y = 2$
 $d = \frac{|1 - 1|}{\sqrt{1 + 1}} = \frac{0}{\sqrt{2}} = 0$
 $x^2 + (\frac{1}{\sqrt{2}})^2 = d^2 \Rightarrow x^2 = \frac{1}{2} \Rightarrow x = \frac{1}{\sqrt{2}}$
 $y = \frac{1}{\sqrt{2}}$
 $\frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{2}} = \frac{1}{2}$

$A(1, 0) \quad x - y = 1$
 $AB^2 = AH^2 + BH^2 \rightarrow BH = \frac{1}{\sqrt{2}}$
 $S = \frac{1}{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = \frac{1}{4}$

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

$S = \frac{1}{2} \cdot BC \cdot h = \frac{1}{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = \frac{1}{4}$

$(-\frac{1}{4}, a)(-\frac{1}{4}, b) \quad AB = (-\frac{1}{4} + \frac{1}{4}, b - a) \Rightarrow (0, b - a)$

$\frac{b - a}{\frac{1}{4}} = \sqrt{2} \Rightarrow a - b = \frac{\sqrt{2}}{4}$
 $|AB| = \sqrt{(\frac{1}{4})^2 + (b - a)^2} = \sqrt{\frac{1}{16} + \frac{1}{16}} = \frac{1}{4}$
 $\frac{1}{4} \times \sqrt{2} = \frac{\sqrt{2}}{4}$

مرکز (0,0)
 $P = (-3, -4)$

$OP = \sqrt{(-3)^2 + (-4)^2} = 5$ $x^2 + y^2 = 25$

(1)

شیب $m = -\frac{3}{4}$ $\frac{-4}{-3} = \frac{4}{3}$
 چون شیب عمود بر شیب $m = -\frac{3}{4}$
 عمود

شیب $m_2 = \frac{4}{3}$
 این خط عمود بر خط اول است

فاصله مرکز از خط $5 = \frac{|b|}{\sqrt{(\frac{4}{3})^2 + 1}} = |b| = 25$
 برای ایند نقطه $b = \pm 25$

$y = \frac{4}{3}x + b$
 معادله خط دوم $y = \frac{4}{3}x + \frac{25}{4}$

در این خط x منفی و y مثبت پس باید $b = \frac{25}{4}$
 در این خط x مثبت و y منفی پس باید $b = -\frac{25}{4}$

معادله خط اول $y + 4 = -\frac{3}{4}(x + 3)$

حل دستگاه $-\frac{3}{4}(x + 3) - 4 = \frac{4}{3}x + \frac{25}{4} \Rightarrow x = -7, y = \frac{4}{3}(-7) + \frac{25}{4} = -1$
 نقطه برخورد خط $(-7, -1)$

معادله خط $x = -7$
 یا $x = -7$