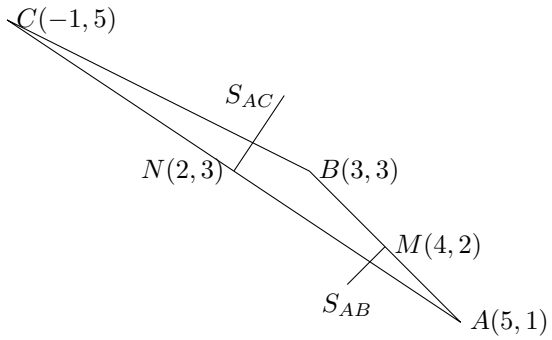

$A(5,1),\ B(3,3)\ C(-1,5)$

$S_{AB},\ S_{AC} =?$

$S_{AB} \cap S_{AC} =?$

$R =?$

$$S_{AB} : \begin{cases} z\ M \\ \perp\ AB \end{cases}$$

$M(\frac{5+3}{2}, \frac{1+3}{2}) \implies M(4,2)$

$$AB : \begin{cases} z\ A(5,1) \\ z\ B(3,3) \end{cases}$$

$$AB : \begin{vmatrix} x-3 & y-3 \\ 2 & -2 \end{vmatrix} = 0$$

$AB : -2x + 6 - 2y + 6 = 0$

$AB : -2x - 2y + 12 = 0 \mid -\frac{1}{2}$

$AB : x + y + 6 = 0$

$S_{AB} \perp AB \implies S_{AB} : -x + y + C = 0$

$M(4,2)\ z\ S_{AB} \implies -4 + 2 + C = 0$

$\implies S_{AB} : -x + y + 2 = 0$

$$S_{AC} : \begin{cases} z\ N \\ \perp\ AC \end{cases}$$

$N(\frac{5-1}{2}, \frac{1+5}{2}) \implies N(2,3)$

$$AC: \begin{cases} z\ A(5,1) \\ z\ C(-1,5) \end{cases}$$

$$AB: \begin{vmatrix} x-5 & y-1 \\ -6 & 4 \end{vmatrix} = 0$$

$$AC: 4x - 20 + 6y - 6 = 0$$

$$AC: 4x + 6y - 26 = 0\ |\tfrac{1}{2}$$

$$AC: 2x + 3y - 13 = 0$$

$$S_{AC} \perp AC \implies S_{AC}: -3x + 2y + C = 0$$

$$N(2,3)\ z\ S_{AC} \implies -6 + 6 + C = 0$$

$$\implies S_{AC}: -3x + 2y = 0$$

$$S_{AB} \cap S_{AC} = O(x_O, y_O)$$

$$\begin{array}{rcl} -3x_O + 2y_O & = & 0 \\ -x_O + y_O + 2 & = & 0\ |-3 \end{array}$$

$$\begin{array}{rcl} -3x_s + 2y_O & = & 0 \\ 3x_O - 3y_O - 6 & = & 0 \end{array}$$

$$y_O = -6 \implies x_O = -4 \implies O(-4,-6)$$

$$\overrightarrow{BS}(-7,-9)$$

$$|\overrightarrow{BS}| = \sqrt{49+81} = \sqrt{130} = R$$