

2016年全学部2月3日第4問

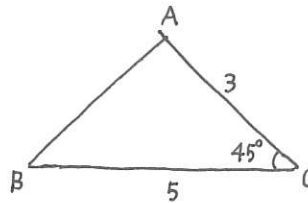

 数理  
石井K

4 次の  $\triangle ABC$  の面積を求めよ。ただし、 $BC = a$ ,  $CA = b$ ,  $AB = c$  とする。

(1)  $a = 5$ ,  $b = 3$ ,  $\angle C = 45^\circ$

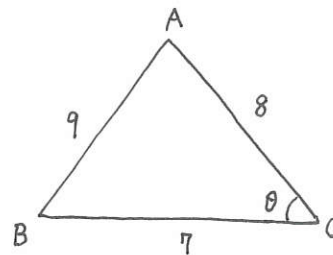
(2)  $a = 7$ ,  $b = 8$ ,  $c = 9$

$$\begin{aligned}
 (1) \quad S &= \frac{1}{2} \cdot 3 \cdot 5 \cdot \sin 45^\circ \\
 &= \frac{15}{2} \cdot \frac{\sqrt{2}}{2} \\
 &= \frac{15\sqrt{2}}{4} \text{ 〃}
 \end{aligned}$$



(2)  $\angle C = \theta$  とおくと 余弦定理より

$$\begin{aligned}
 \cos \theta &= \frac{7^2 + 8^2 - 9^2}{2 \cdot 7 \cdot 8} \\
 &= \frac{49 + 64 - 81}{2 \cdot 7 \cdot 8} \\
 &= \frac{2}{7}
 \end{aligned}$$



$$\begin{aligned}
 \therefore \sin \theta &= \sqrt{1 - \left(\frac{2}{7}\right)^2} \\
 &= \frac{3\sqrt{5}}{7}
 \end{aligned}$$

$$\begin{aligned}
 \therefore S &= \frac{1}{2} \cdot 8 \cdot 7 \cdot \sin \theta \\
 &= \frac{1}{2} \cdot 8 \cdot 7 \cdot \frac{3\sqrt{5}}{7} \\
 &= \frac{12\sqrt{5}}{1} \text{ 〃}
 \end{aligned}$$