

餘弦定律

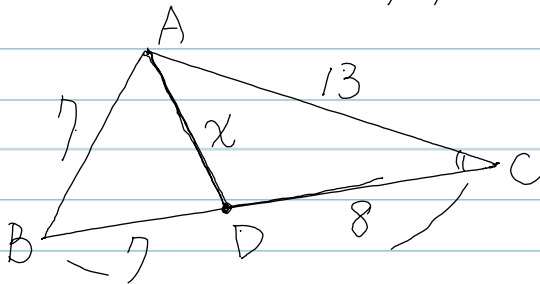
(1) 在 $\triangle ABC$ 中, 若 $\overline{AB} = 7$, $\overline{BC} = 4\sqrt{2}$, $\overline{CA} = 5$
 則 $\cos A = ?$

Sol. 餘弦定律: $\underline{a^2 = b^2 + c^2 - 2bc \cos A}$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

$$\cos A = \frac{25 + 49 - (4\sqrt{2})^2}{2 \cdot 5 \cdot 7} = \frac{25 + 49 - 32}{70} = \frac{42}{70} = \frac{6}{10} = \frac{3}{5}$$

(2) 在 $\triangle ABC$ 中, 若 D 點在 $\overline{BC}$ 邊上, 且 $\overline{AB} = 7$
 $\overline{AC} = 13$, $\overline{BD} = 7$, $\overline{CD} = 8$, 則 $\overline{AD} = ?$



$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

$$\begin{array}{ccc} \triangle ACD: & & \triangle ABC \\ \cos C = \frac{13^2 + 8^2 - x^2}{2 \cdot 13 \cdot 8} & = & \frac{13^2 + 15^2 - 7^2}{2 \cdot 13 \cdot 15} = \cos C \end{array}$$

$$x^2 = 49 \quad x = \pm 7 \text{ (負不合)} \quad \therefore \overline{AD} = 7$$