

無字證明：和角公式、差角公式、倍角公式、半角公式

(資料來源：龍騰教師手冊)

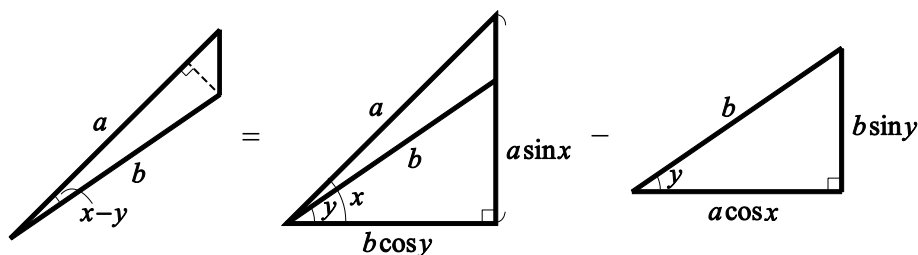
介紹五個與本章內容有關的無字證明：

1. 正弦的和角公式

$$r = \frac{1}{2} \Rightarrow \sin z = \frac{\frac{c}{2}}{\frac{1}{2}} = c, \quad \sin x = a, \quad \sin y = b;$$

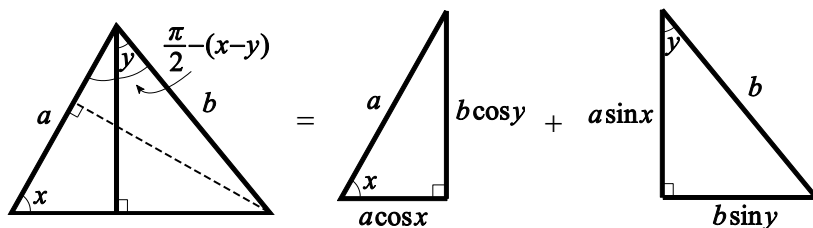
$$\sin(x+y) = \sin(\pi - (x+y)) = \sin z = \sin x \cos y + \sin y \cos x.$$

2. 正弦的差角公式



$$\sin(x-y) = \sin x \cos y - \cos x \sin y$$

3. 餘弦的差角公式



$$\cos(x-y) = \cos x \cos y + \sin x \sin y$$

4. 二倍角公式

$$\triangle ACD \sim \triangle ABC$$

$$\frac{\overline{CD}}{\overline{AC}} = \frac{\overline{BC}}{\overline{AB}}$$

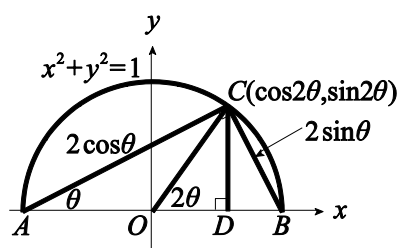
$$\frac{\overline{AD}}{\overline{AC}} = \frac{\overline{AC}}{\overline{AB}}$$

$$\frac{\sin 2\theta}{2 \cos \theta} = \frac{2 \sin \theta}{2}$$

$$\frac{1 + \cos 2\theta}{2 \cos \theta} = \frac{2 \cos \theta}{2}$$

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$\cos 2\theta = 2 \cos^2 \theta - 1$$



5. 半角公式

$$\tan \frac{\theta}{2} = \frac{\sin \theta}{1 + \cos \theta} = \frac{1 - \cos \theta}{\sin \theta}$$

