逆天的积化和差推导

#证明 #三角函数

由三角和差公式得

$$\sin(\theta + \phi) = \sin(\theta)\cos(\phi) + \cos(\theta)\sin(\phi)$$

$$\sin(\theta - \phi) = \sin(\theta)\cos(\phi) - \cos(\theta)\sin(\phi)$$

故

$$\sin(\theta)\cos(\phi)=\sin(\theta+\phi)-\cos(\theta)\sin(\phi)$$

$$=\sin(heta+\phi)+\sin(heta-\phi)-\sin(heta)\cos(\phi)$$

整理得

$$2\sin(heta)\cos(\phi) = \sin(heta + \phi) + \cos(heta + \phi)$$

即

$$\sin(heta)\cos(\phi) = rac{1}{2}[\sin(heta+\phi)+\cos(heta-\phi)]$$

Q.E.D