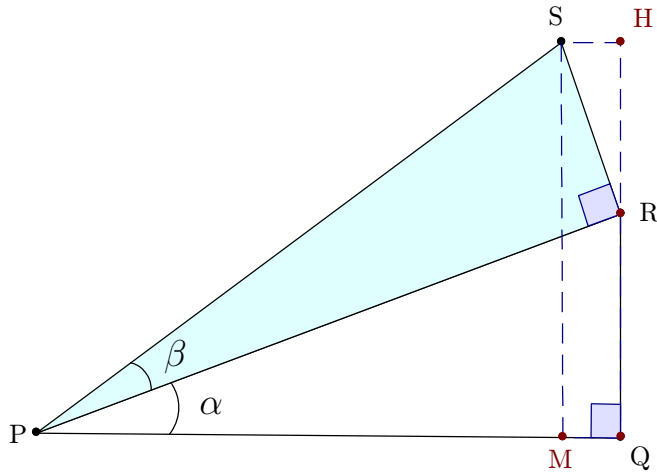## Understanding *Double angle formulae*

Question (Tuesday 31.1.2017)

Let us consider PS $=1$

i) Give an expression for $\sin(\alpha + \beta)$ based on the triangle PMS

ii) Give an expression for $\sin(\alpha)$ based on the triangle PQR

iii) Give an expression for $\cos(\alpha)$ based on an other triangle !

iv) Give an expression $\sin(\beta)$ and $\cos(\beta)$ based on triangle PRS

v) then show that QR$= \sin(\beta)\cos(\alpha)$

vi) find a similar expression for RH

Hence show : $\boxed{\sin(\alpha + \beta) = \sin(\alpha)\cos(\beta) + \sin(\beta)\cos(\alpha)}$ (I)

We have also : $\boxed{\cos(\alpha + \beta) = \cos(\alpha)\cos(\beta) - \sin(\alpha)\sin(\alpha)}$ (I I)

Notice : these two relations are not to be know for IB SL.

        But the following are important:

taking $\beta = \alpha$ (I)   becomes $\sin\left(\quad\quad\right) =$

              (I I)   becomes $\cos\left(\quad\quad\right) =$

Notice : These last two identities are written in your *formula booklet* Page 4, Topic 3

       as : « (3.3) *Double angle formulae* »