Product Formulae (C)

We may also derive identities for *sin*(A)*sin*(B), *sin*(A)*cos*(B) and *cos*(A)*cos*(B) from the addition and subtraction formulae. We have

$$cos(A)\,cos(B) = \frac{1}{2}(cos(A-B) + cos(A+B)),$$

$$sin(A)\,sin(B) = \frac{1}{2}(cos(A-B) - cos(A+B)),$$

and

$$sin(A)\,cos(B) = \frac{1}{2}(sin(A-B) - sin(A+B)),$$

Exercise:

Derive these identities. For the first and second identity, add and subtract the sum and difference formulae for cosine. For the third, add the sum and difference formulae for sine.