**Yuan Gao z5239220 Q2**

You are given a polynomial where , , can be arbitrarily large integers. Design an algorithm which squares using only 5 large integer multiplications.

We can use the Karatsuba trick (slicing into 3 pieces):

Lets

(

Lets:

Forwe have:

Thus, if we represent the product we get

We can now compute

Note that the expression involves only 5 multiplications:

, , , ,