

Question 1.

Marks: 2.0

What is the Euler Totient value of  $123$ ,  $\varphi(123)$  ?

Question 2.

Marks: 4.0

Using Euler's Theorem find the last two digits of  $2^{803}$ . Hint: Compute  $\varphi(100)$ .

Question 3.

Marks: 4.0

We see that despite the AKS algorithm giving us a deterministic polynomial time primality proving algorithm, implementations still use probabilistic tests like the Miller-Rabin test. Why is that so? Can you state one other reason for the immense importance of AKS algorithm other than the fact it is a deterministic polynomial time primality testing algorithm?  
(2+2 marks)