

4. (a) Suppose Eve sees that Bob has chosen " $k=47$ " and " $N=87$ " and Alice has sent " $b=11$ " to Bob? What is the secret number Alice wants to communicate to Bob?

(b) What is the difference between Bob's job and Eve's job in this problem? How secure is the message?

5. (a) Suppose that Eve intercepts a message from Alice to Bob. The encoded message is "35" and Eve knows that " $n=493$ " and " $k=5$ ", and that the secret message is the number of Al Qaeda operatives planning to steal a car. How many Al Qaeda operatives are coming?

(b) How long did it take you to factor 493? How secure is the message?

6. Suppose now that Alice and Bob are Al Qaeda operatives and Alice wants to send Bob the apartment number where an Al Qaeda cell is staying.
- (a) Eve sees that Bob sent Alice “ $n=21311$ ” and “ $k=13$ ”, and Alice sent Bob “15”. What is the apartment number?. How long does it take you to factor 21311?
- (b) Now suppose that Bob changes k so now “ $k=17$ ”. Suppose Bob receives the encrypted message “113”. What is the secret apartment number?