[Q1] (a)

In total there are 12 emails, of which 9 are spam mails, and 3 non spam mails. The chance, derived from this data, of an email being spam is: 0.75, while the chance of not being spam is: 0.25.

[Q1] (b)

Total number of emails which include the word “Viagra”: 7.  
Total number of emails which include the word “Viagra” and are marked as spam: 6.  
Probability of an email being spam when it contains the word “Viagra”: 0.857.

Total number of emails which include the word “donation”: 3.  
Total number of emails which include “donation” and are marked as spam: 2.  
Probability of an email being spam when it contains the word “donation”: 0.667.

[Q1] (c)

Formula from the lecture:

Probability according to the Naïve Bayes model that an email which contains the word “Viagra", but not the word “donation", is spam:

[Q1] (d)

Probability according to the Naïve Bayes model that an email which contains the word “donation", but not the word “Viagra", is spam: