

1. The sensitivity would be 0 because there would be no spam emails that are classified as spam, since all emails are predicted as ham. The specificity would be 1 because all ham emails would be classified as ham.
2. It would be the proportion of ham emails to total emails in the training set, or $6208/8348$ (0.74365117393). Since it only predicts ham, the ham emails are correctly predicted while the spam emails are incorrectly predicted.
3. Because it is barely more accurate than the above classifier of just predicting ham for each email, so the classifier can be a lot better.
4. The sensitivity is $238/2140$ (the number of predicted spams over the real number of spams) and the precision is $6071/6208$ (the number of predicted hams over the real number of hams). False positives seem like the more likely mistake that the classifier might make based on this.
5. One reason may be that using those certain key words may not be the best indicator of what a spam email is. For example, 'prescription' can be in both spam and ham emails, so it doesn't help the classifier much.

