M561 Problem Set Number 2

1. Problems 3.1, 3.2, 3.3, 3.5
2. Problems 4.1, 4,2, 4,3
3. Problems 5.1, 5.3
4. Derive equation 3.18 on page 23.
5. Compute the rank 5, 10 and 20 approximations to the clown image in matlab using the following commands:

   - load clown.mat;
   - $[U, S, V]$ =svd(X);
   - colormap('gray');
   - image$(U(:, 1:k) * S(1:k, 1:k) * V(:, 1:k)')$

   Plot the original image and the 3 approximations, preferably on the same page. Compute the compression rations in each case.