1. The vector $1:4:9$ has length 3.

2. True/False. If $A$ and $B$ are vectors, then $A+B$ gives the concatenation of the two vectors.

3. If vector $A$ is $[ 1 \ 0 \ 4 \ 0 \ ]$ then $\sim A$ is $[ 0 \ 4 \ 0 \ 1 \ ]$

4. True/False. If $C$ is a vector every entry of which is 0, 1 or $-1$, then the code
   \[
   \text{sum}(C.^{\sim6})
   \]
   will report the number of nonzero entries in the vector.

5. According to the wikipedia article on data structures, an example of a data structure is
   (a) A binary tree
   (b) An array
   (c) A linked list
   (d) All of the above

6. Consider the following MATLAB code.

   ```matlab
   tot=0;
   for i=1:length(X)-1
       for j=i+1:length(X)
           if X(i)==X(j)
               tot=tot+1;
           end
       end
   end
   if tot==3
       fprintf( 'Yes');
   end
   ```

   (a) Which of the following choices for the vector $X$ would cause this code to print out ‘Yes’?
      (i) $[ 1 \ 2 \ 3 ]$ (ii) $[ 1 \ 1 \ 1 ]$ (iii) $[ 1 \ 2 \ 1 ]$ (iv) none of the above.

   (b) What condition of the vector $X$ does this code test for? That is, exactly when does it print out ‘Yes’? Be specific.