Here are ten questions for you to try with some from the book. Please use lots of space when writing your solutions. It is very important that you show clearly any work you had to do to get your answers.

---

(1) Page 689, Question 1

(2) Page 689, Question 6

(3) As we saw, the Hollywood graph has actors for its vertices. Two actors are connected by an edge if they have appeared in the same film. If an actor has a vertex in the same connected component as Samuel L. Jackson, what does that mean?

[Hint: it does not necessarily mean they have been in a film with Samuel L.]

(4) **(a)** Write down the adjacency matrix for the graph K_4.

   (b) Find the second power of this matrix and use it to compute the number of paths of length 2 between any two different vertices of K_4.

   (c) Find the third power of the adjacency matrix and use it to compute the number of paths of length 3 between any two different vertices of K_4.

(5) Page 690, Question 20

(6) Page 703, Question 2

(7) Page 704, Question 6

(8) Page 704, Question 10

(9) Which of these graphs have Euler circuits? Explain why or why not in each case.
   (a) C_{100} **(b)** W_9 **(c)** K_{99} **(d)** $K_{2,4}$

(10) Page 705, Question 36

If you understand the homework questions then you will be able to do the exam questions. You can also try the other questions listed on the syllabus to get extra practice. For any difficulties with the homework, please email me any time.