Question 1
Spline and polynomial interpolation were covered in Lecture 15. To answer this question:

1. Compute the spline and interpolating polynomial.

2. Graph the error in each of these, that is the difference between interpolating function and $y = \sqrt{x}$.

Question 2
This is an example of general interpolation covered in Lecture 15. To determine the coefficients:

1. Form the basis matrix by evaluating each of the basis functions at each of the $x$ data points.

2. Solve the associated linear system with the $y$ data points as the right-hand-side vector to get the coefficients.

Question 3
You need to know more about interp to find the derivatives of the cubic spline, so part of this question is a test of using Scilab’s help.

Question 4
Use the function polyfit from Lecture 16. I want you to think about your answer to this question.
Question 5

Linear programming problems were covered in Lecture 17. There are two steps to solving the assignment question:

1. Formulate the problem as a linear programming problem. This is the difficult part.

2. Solve the linear programming problem in Scilab. This step is pretty mechanical once the problem is formulated correctly.

To formulate the linear programming problem follow the steps given in Lecture 17:

1. Identify the Variables:
   There are just 5 variables, the amount of each product to produce.

2. Write down the objective:
   The objective is to maximize the profit. For each of the 5 products, the profit per unit is the selling cost minus the materials cost minus the machine costs. The machines costs are determined by the time on each machine and the cost of operating the machine.

3. Write down the constraints:
   Besides the constraints on the minimum of each product produced, the only constraints are that each machine is limited to 80 hours operation. The time each machine is in operation is determined by the number of units of each product produced.