2000 Paper 2 Question 1

Multi-part question

Answer all five parts.

(a) Prove that there are no integer solutions to $x^5 - 3x^2 + 2x - 1 = 0$. [4 marks]

(b) Draw a picture of a *deterministic* finite automaton which accepts the language of strings matching a^*ba. [4 marks]

(c) Describe the operation of the Unix shell with reference to the process management system calls it makes use of. You might like to use pseudo-code or a diagram to aid your description. [4 marks]

(d) What is the purpose of a formal specification language such as Z? [4 marks]

(e) Describe ML's datatype declaration. Show an example of a function declaration that uses pattern matching on possible values of the data type.
[4 marks]