7 Further Java (ARB)

A Java developer implements a class loader as follows:

```
public class NetworkClassLoader extends ClassLoader {

 private String server;
 private int port;

 NetworkClassLoader(String server, int port) { ... }

 @Override
 public Class<?> findClass(String name)
             throws ClassNotFoundException {
  //TODO: download class file and place contents in byte array b.
  return defineClass(name, b, 0, b.length);
 }
}
```

(a) Describe what a Java class loader is, when it is used, and why a developer might need to implement their own class loader. [3 marks]

(b) Write a Java program which accepts two arguments on the command line: a network port number and the full path to a Java class file in the file system. When executed, your program should wait indefinitely on the specified port for connections from clients. Whenever a client connects, your program should send the contents of the Java class file to the client. [8 marks]

(c) Complete the method `findClass` by downloading the class file from the program you wrote in part (b). Any error states should generate a `ClassNotFoundException`. [8 marks]

(d) Outline a security vulnerability which might arise when using your implementation of `NetworkClassLoader` from part (c) together with the server you wrote for part (b). [1 mark]