

## Quiz 4

Name: \_\_\_\_\_

### 1. A recursive procedure for powering

In class, we covered a fast, iterative procedure for raising a number  $x$  to the power  $n$ , that takes time proportional to  $\log n$ . Write a simple *recursive* procedure to do the same. (You may use “pseudocode” or any programming language. The precise syntax is not important.)

Hint: For recursion, separate the cases:  $n$  is even or odd. Also remember the base case.

2. The following questions concern the article on the Java Virtual Machine that was handed out last week:

(a) The article claims that the concept of JVM makes Java more portable. Explain how.

- (b) Give one-sentence definitions for each of the following components of the Java Virtual Machine: the *stack*, the *program counter*, and the *heap*.