Math 4330, Homework 8, Due 3/31/2014 [1]

Read 4.5.4, *Primality Testing*, pp. 391–396.

1. Write a function `isprime(n, numtests)` which performs Algorithm P upto `numtests` times to determine if n is (probably) prime. It should return `False` if one of the tests indicates that n is composite and `True` otherwise. You will need to re-use your `powmod()` function from Homework 7 and you can generate random numbers as follows:

```
import random

# The following generates a random integer in the range [1,100)
t = random.randrange(1,100)
```

2. Complete the following table and make a conjecture: (use `numtests = 10`).

Interval $[a, b]$	# of primes	(# primes)/(interval size)	$1/\log a$
$[10^5, 10^5 + 1000]$			
$[10^{10}, 10^{10} + 1000]$			
$[10^{20}, 10^{20} + 1000]$			
$[10^{40}, 10^{40} + 1000]$			
$[10^{80}, 10^{80} + 5000]$			

3. Use your code to find the largest prime having 120 digits. Explain how you found it.