

Quiz 4

Student ID Number:

Name _____

Math 173A, 3PM

Please justify all your answers

July 8, 2019

Please also write your full name on the back

1. (a) Define what it means for a function $f(x)$ to be $O(g(x))$ for some function $g(x)$.

(b) Show that the function $f(x) = x \log(\sqrt{x}) + 5x$ is $O(g(x))$, where $g(x) = x \log x$.

2. Alice and Bob wish to establish a shared secret using the Diffie-Hellman key exchange protocol. They publicly agree on the prime $p = 23$ and $g = 5$. Alice's public key is $A \equiv 7 \pmod{23}$. Calculate their shared secret and Bob's public key if Bob chooses $b = 5$ as his private exponent.