MA/CSSE 473 Day 05

1. An Extended Binary Tree with n internal nodes has _____ external nodes.

   Prove the statement from the previous question using (strong) induction, based on the definition of EBT.

2. Which is harder (computationally): factoring numbers or determining whether numbers are prime?

3. Trace the integer division algorithm from class for `divide(19, 4)`.

4. If x, y and N are k-bit integers, then the time requirement to compute (x + y) (mod N) is Θ ( ).

5. If x, y and N are k-bit integers, then the time requirement to compute (x * y) (mod N) is Θ ( ).

6. When exponentiating n-bit numbers x^y (mod N), where N is also n-bit, how many recursive calls are needed?

7. Each call is Θ( )

8. Entire exponentiation algorithm is Θ( )

9. What problem does Euclid's Algorithm solve?

10. Show the recursive calls for Euclid's Algorithm applied to a=188 and b=144.