

**COT 3100 Recitation #3: Log Problems**  
**9/8-11/2020**

**Problem Solved in Recording**

- 1) What is the value of  $(81^{\log_3 1234})^{0.25}$ ?
- 2) Determine the ordered pair, (a, b), that satisfies the following pair of equations:

$$\log_{16} a^2 + \log_8 b^3 = 11$$

$$\log_8 a^6 + \log_{16} b^{10} = 32$$

Note: You may express a and b as a some base raised to an exponent instead of a single value, if you wish.

- 3) What is the value of a for which  $\sum_{i=2}^{10} \frac{1}{\log_i a} = 1$ ?
- 4) The sequence  $\log_{12} 162, \log_{12} x, \log_{12} y, \log_{12} z, \log_{12} 1250$  is an arithmetic progression. What is x?

**Problems For Recitation**

- 1) Solve for x in the following equation:  $\log_2 x^3 + \log_4 (8x^2) = -\frac{5}{2}$
- 2) If  $3^{\log_9 x} = 9^{\log_3 27}$ , what is the prime factorization of x?
- 3) What is the value of the following summation?

$$\sum_{i=1}^n \log_{n!} i$$

- 4) Define a function f as follows:  $f(1) = 2$ . For all integers  $n > 1$ ,  $f(n) = (f(n-1))^{2^n}$ .

What is the value of  $\log_{65536}(\log_{65536}(f(4)))$ ?

Express your answer in the form  $2^a + 2^b$ , where both a and b are integers. Note that  $65536 = 2^{16}$ .