Math 1190 Quiz #1

**Problem 1:** The sequence of natural numbers is partitioned into groups as shown. What is the sum of the integers in the $n^{th}$ group?

$$(1) , (2, 3) , (4, 5, 6) , (7, 8, 9, 10) , (11, 12, 13, 14, 15) , (16, 17, 18, 19, 20, 21) , \ldots$$

**Problem 2:** Given $n \geq 1$, show that the integer $2^{2^n} - 1$ has at least $n$ distinct prime divisors.

**Problem 3:** Show that every positive integer is the sum of integers of the form $2^a3^b$ such that no summand divides another.
Problem 1: The sequence of natural numbers is partitioned into groups as shown. What is the sum of the integers in the $n^{th}$ group?

$(1), (2, 3), (4, 5, 6), (7, 8, 9, 10), (11, 12, 13, 14, 15), (16, 17, 18, 19, 20), \ldots$
Problem 2: Given $n \geq 1$, show that the integer $2^{2^n} - 1$ has at least $n$ distinct prime divisors.
Problem 3: Show that every positive integer is the sum of integers of the form $2^s3^t$ such that no summand divides another.