

**SchoolNova, Math 5c**  
**Homework 1**  
**Prime Factorization, GCD, LCM**  
**September 15, 2019**

Please provide sufficient details about how you solved the problem. More difficult problems are marked with a \*. If unable to solve a problem, please present your thoughts and partial solution.

1. Find the prime factorization of the following numbers: (a) 1245 (b) 1352 (c) 1683
2. Find the Least Common Multiple (LCM) and Greatest Common Divisor (GCD) of the following numbers, using prime factorization:
  - 42 and 52.
  - 51 and 340.
  - 1012 and 1232.
3. Consider the number  $2 \times 2 \times 2 \times 5 \times 5 \times 7 \times 11$ . In how many zeros does it end? (Try doing it without performing the multiplication).
4. Said Anne to Betty: "If you give me one marble, we will each have the same number of marbles."  
Said Betty to Anne: "If you give me one marble, I will have twice as many marbles as you will have."  
How many marbles did Anne have (before the exchange)?
5. A merchant came to the market to sell some eggs. A first buyer took half her eggs plus another  $1/2$  egg. A second buyer took half the remaining eggs plus another  $1/2$  egg. A third buyer took only what was left over: 1 egg. A buyer never takes a broken egg home. How many eggs were there initially?
- 7.\* Let  $a$  be a counting number.
  - (a) What is the GCD of  $a$  and  $a + 1$ ?
  - (b) What is the GCD of  $a$  and  $a + 2$ ?
- 8.\* It is known that  $a + 1$  is divisible by 3. Show that  $4 + 7a$  is also divisible by 3.