Classwork 1 Arithmetic and Geometric Sequences

Remember to explain your results!

1. 2 - 4 + 8 + 16 - 32 + 64 +128 - 256 + 512 ... - 4096 =

2. A geometric progression has 99 terms, and the first term is 12 and the last term is 48. What is the 50^{th} term?

3. An arithmetic progression begins with the terms 50, 47, 44, ... Will 0 be part of this arithmetic progression?

4. How many multiples of 7 are there between 1 and 1000? Can you find the sum of them all?

5. If we put one grain of wheat on the first square of the chessboard, two on the second, then four,eight,. . . , approximately how many grains of wheat will there be? (You can use 2^{10}= 1024 which is about 10^3).Can you estimate the total volume of all this wheat — and compare with the annual wheat harvest of the US, which is about 13 billion liters. (A grain of wheat is about 10 mm^3; a liter is 1000 cm^3)

6. Find the sum 1 + 3 + 5 +···+ 999=

7. $\frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3} + ...$

8. Simplify: $0.\bar{9}$

9. What is the sum of all powers of 2 that are less than 1000?

10. What is the product of all powers of 2 that are less than 1000?

Now for something different...

11. John makes lemonade with a certain ratio of sugar to juice. If he doubles the sugar, the drink will have 10% sugar. What is the ratio of sugar to lemon juice in the original recipe?