Group task in discrete math 10 September 2018

Edited at 4am 10 September 2018.

1. Prove.

a. **A ∪ A ∩ B = A** b. **A ∩ (A ∪ B) = A c. (A ∪ B ∩ C)´ = (C´ ∪ B´) ∩ A´**

2. Study:

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/4sequences.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/5relations.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/6primes.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/7combinatorics.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/8probability.ppt

https://discrete4math.weebly.com/uploads/2/5/3/9/25393482/9relations.ppt

3. Find f(f(f(f(f(2))))) if f(x) = x2.

4. Solve Fibonacci recurring relation. 1, 1, 2, 3, 5, 8, . . .

5. There are 23 cats in a village this year. The growth of the population of the cats is 7% per year. How many cats will there be in the village in 9 years from now?

6. Give the algorithms to find Highest Common Divisor and Lowest Common Multiple.

Include Euclidean algorithm.

http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/euclidean4algorithm.txt

7. Represent each of these decimal numbers in numeral systems with bases 2,5,7,9,16. a.67 b.94

http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/number2convert.txt

8. Give the best algorithm of finding the largest prime number.

http://discrete4math.weebly.com/uploads/2/5/3/9/25393482/primes2find.txt

9. Why are prime number and factorization important?

10. Calculate big integers.

https://en.wikipedia.org/wiki/Arbitrary-precision\_arithmetic

11. Find the number of grains for the Chess problem.

12. How many up to 6-symbols passwords can be made of 26 letters (a-z) and 10 digits (0-9)?

13. How would you cheat in a multiple choice exam if you do not know the answers using your knowledge in discrete math?

14. What are independent random variables and how the compound probability is given in this case?

15. Calculate random between 1 and 5 using Excel 5 times. Draw the histogram.

16. Sum the calculated random between 1 and 5 using Excel 5 times. Draw the histogram of the sums.

17. Make histogram of first 9 digits of π.

18. Give the histogram of Benford of the first digit of 9 the most populated countries.

http://www.worldometers.info/world-population/population-by-country/

Use of your math knowledge and skills:

19. Try to apply for all grants, scholarships, fellowships, etc. in embassies of USA, Canada, Europe, Australia, Japan, etc.