Class_27 June 20 - Test 7

Tuesday, June 20, 2023 2:58 PM

Tonight's Class:

- **"Exit" questionnaire**
- **Do the LEC Student Survey, QR code below**
- **Questions?**
- **Hand in Geometric Series assignment**
- **Week 7 Test**
  - **If you decide you wish to do rewrites, please come to class (regular place and time) tomorrow, Wednesday, June 21**

Classroom Teaching Staff

LEC Staff - classroom teaching staff - please find time in your classes (structured, OL, DL) to have students complete the following end of year survey.

Survey is here

QR code is attached

See less

Summation/sigma notation shows up in many places

1. **Money**

Present value of a future sum [edit]

The present value formula is the core formula for the time value of money; each of the other formulae is derived from this formula. For example, the annuity formula is the sum of a series of present value calculations.

The present value (*PV*) formula has four variables, each of which can be solved for by numerical methods:

$$PV = \frac{FV}{(1+i)^n}$$

The cumulative present value of future cash flows can be calculated by summing the contributions of FV_t, the value of cash flow at time *t*:

$$PV = \sum_{t=1}^{n} \frac{FV_t}{(1+i)^t}$$

Note that this series can be summed for a given value of *n*, or when *n* is ∞.[8] This is a very general formula, which leads to several important special cases given below.

2. **Computer science**

https://everythingcomputerscience.com/discrete_mathematics/Summations.html

1. **More math**
   http://homepages.gac.edu/~holte/courses/mcs256/documents/summation/top10sums.pdf

   https://www.math.ucdavis.edu/~kouba/CalcTwoDIRECTORY/summationdirectory/Summation.html

   https://mathworld.wolfram.com/ExponentialSumFormulas.html
2. **Ultrasound imaging research**

This is describing cross-talk interference between two points when doing ultrasound imaging.

where t is only required to take on values in
$T_{i,j}(k) = \left[\max(t_{j\to k}, t_{i\to k}), L_m + \min(t_{j\to k}, t_{i\to k})\right]$ for any given k.

$$\langle \Phi_j, \Phi_i \rangle = \sum_{m',m} a_m(j) a_{m'}(i) \sum_k \frac{1}{|r_k - r_j|} \frac{1}{|r_k - r_i|} \sum_{t'} h_m(t') h_{m'}(t' + t_{j\to k} - t_{i\to k})$$

It is intuitive to view this as a sort of cross-correlation. To make this clearer, we reorder the sums and make a change of variables to $t' = t - t_{j\to k}$:

A few closing thoughts…

Week 7 Test

Please:

1. **Make sure your name is on the Geometric Sequences/Series assignment and hand it in.**

2. **Clear your desk of any materials except for your calculator & something to write with. I will give you a Formula Sheet.**

3. **On your test, write clearly and show all necessary steps. When done, please hand in your test and you are free to go.**

My goal is to mark the tests as soon as I can, and enter them into CheckMy Progress. If you decide you wish to do rewrites, come to class tomorrow, June 21. (If you don't wish to do any rewrite tests, you do not need to attend tomorrow's class.)