Special Topics in Advanced Math: *History of Mathematics*

Math 395 Fall 2023 — Fowler 310 TR 1:30pm - 2:55pm

 — http://sites.oxy.edu/ron/math/395/23/

Homework #12

[12 points total]

ASSIGNED: Tue Nov 21 2023 **DUE: Thu Nov 30 2023**

Informal Homework Responses

The first set of questions counts as one informal homework response. They can be (**neatly!**) handwritten although since these are all short essays I would strongly prefer if they were typed (your choice whether to use LaTeX or not).

Mathematics and Mathematicians of the last Century

Homework #12 will provide you the opportunity to learn more about the organizations, people, and concepts related to mathematics over the last century (1923 to the present).

1. **Mathematicians** *[6 points]*. Write a short synopsis (at least 100 words) of two mathematician we have not previously discussed in class (i.e. they don't appear in any class Worksheets) who was born after 1923 (i.e. 100 years ago), one of whom is alive and one of whom is dead. One of your choices should be from an group underrepresented in mathematics (i.e., person of color or women). For each mathematician you select you should include a sentence that explains why you selected this mathematician to write about. [Put the word count near the title of the synopsis.]

2. **Mathematical Organizations** *[3 points]*. Write a short (150-250 words) history of a mathematical organization that is still active today. Describe the focus/mission of the organization and an notable successes/accomplishments or people involved with it. Some suggestions are: Association for Women in Mathematics (AWM), American Mathematical Society (AMS), Mathematical Association of America (MAA), National Association of Mathematicians (NAM), the International Mathematics Union (IMU), Benjamin Banneker Association (BBA) and other institutional members of the Conference Board of the Mathematical Sciences (CBMS). [Put the word count near the title of the synopsis.]

3. **Mathematical Ideas** *[3 points]*. Write a short (150-250 words) explanation of a mathematical concept that was (or still is) important in the twentieth or twenty-first centuries. One source of concepts to choose from is from Hilbert's 23 Problems. Other possible ideas are anything involving computers and algorithms (chaos, numerical solution techniques, fractals, cryptography, machine learning, etc) or by any of the Fields Medallists. Your synopsis should contain a figure, mathematical symbols or equations.

   You should include a sentence that explains why you selected this particular mathematical concept to write about.

   [Put the word count near the title of the synopsis.]

(Optional) Formal Homework Responses

Choose ONE of the following problems as a formal homework response. This means that the solution is written up in LaTeX to generate mathematical symbols, uses complete sentences and is in narrative form; the work is done individually.

1. Prove (by induction) that cardinality of the power set, $|P(\mathcal{S})|$, of a set $\mathcal{S}$ with n elements is 2^n. In other words, $\forall n \in \mathbb{N} : |S| = n \Rightarrow |P(\mathcal{S}| = 2^n$.