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MATH2025 WRITING ASSIGNMENT 3:

In the following essay I will discuss the life and work of Mary Cartwright. Mary, a British mathematician, is notorious for her theorem for harmonic functions called Cartwright's theorem. She is also well-known as a founder for what would later be called the chaos theory.

Mary Cartwright was born in a village called Aynho in West Northamptonshire, England, on December 17, 1900. Her family had a heritage of public service and her father, William Digby, was a vicar. After graduating from St. Hugh's college in Oxford, Mary went on to pursue the honors mathematics program. While Mary was lecturing at Girton College, she was working on, as she described it, "very objectionable-looking differential equations". A request by the British Government's Department of Scientific and Industrial Research to the London Mathematical Society in 1938, caught Mary's attention. They needed help solving a difficult and awkward equation - coincidently, she was already working on something similar. Her work on this equation ultimately led her to developing her theorem for harmonic functions.

Cartwright's theorem states that an entire function of exponential type less than pi must be bounded on the whole real axis if it is bounded at the integers. The theorem gives an estimate for the maximum modulus of an analytic function that takes the same value no more than p times in the unit disc. Mary did not only contribute to mathematics with her theorem for harmonic functions, but was also one of the people that pioneered the chaos theory. The chaos theory has to do with seemingly random or incalculable behaviour within complex systems controlled by underlying patterns and deterministic laws. The infamous Butterfly effect is a fundamental principle of this theory.

Mary was a distinguished mathematician and university administrator. She had a very successful career and was the first woman mathematician to be elected into the Royal Soceity. Mary saw her discoveries spearhead modern fields of mathematics and was humbled and proud. Mary is admirable and inspiring to all, especially women. As an aspiring computer scientist and mathematician, Mary instils hope in me. She paved the way so that others like myself may follow in her footsteps.

Mary lead a full and significant life. Her strides towards mathematics are not obsolete and will continue to influence and inspire others. I am convinced that a lot more discoveries will be made based on her work and legacy.

References

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