Financial Mathematics MSc Dissertation MTHM038, 2025/27

Tittle of the Thesis

With special emphasis on examples

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and School of Economics and Finance
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Declaration of original work

This declaration is made on January 30, 2026.

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This work is dedicated to ABC XYZ

Acknowledgements

Example text

Abstract

Example text

Contents

Chapter 1

Introduction

This note presents a conjecture stemming from our investigations in the generation of sigmoid tensor categories of Picard numbers of tori in Banach algebras. Example text

1.1 Motivation for this work

In the works of Petri ([P99, Theorem 2.3]) we find the following statement

Theorem 1.1.1 ([P99, Theorem 2.3], see also [BS, pg. 45])**.** *The Gramm matrix for E_8 is:*

$$\begin{pmatrix} 2 & -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ -1 & 2 & -1 & 0 & 0 & 0 & 0 & 0 \\ 0 & -1 & 2 & -1 & 0 & 0 & 0 & -1 \\ 0 & 0 & -1 & 2 & -1 & 0 & 0 & 0 \\ 0 & 0 & 0 & -1 & 2 & -1 & 0 & 0 \\ 0 & 0 & 0 & 0 & -1 & 2 & -1 & 0 \\ 0 & 0 & 0 & 0 & 0 & -1 & 2 & 0 \\ 0 & 0 & -1 & 0 & 0 & 0 & 0 & 2 \end{pmatrix}.$$

1.1.1 The problem of exponential extensions

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1.1.2 The approach of Junderstein

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Chapter 2

Eulerian topological string motives

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2.1 Definitions

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2.1.1 Tate's theorem

Preliminary considerations Example text

Motivic financial algebroids Example text

2.1.2 Grothendieck topologies

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2.2 Calculation of the invariant cycles

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2.2.1 Fontaine's theorem

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Chapter 3

Conclusions

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Appendix A

Implementation of the `BarrierOptionCVA` class

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Appendix B

Additional details on the Gundermanian determinant

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Bibliography

[P99] William Petri, *Analysis of infinitely generated frog complexes*, Rendicoti Ranæ Analysorum, 234 **(4)**, 34–21, 2015

[Ross] Sheldon Ross, *An Elementary Introduction to Mathematical Finance*, 3rd Edition, Cambridge University Press, 2011

[Hull] John C. Hull, *Options, Futures, and Other Derivatives*, 8th Edition, Pearson Education, 2011

[BS] Fischer Black and Myron Scholes, *The Pricing of Options and Corporate Liabilities*, Journal of Political Economy 81 **3**, 637–654, (1973)