Mathematical Finance Winter term 2023/2024

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Sheet QF01P

Mathematical Finance: QF

In-Tutorial exercises (for discussion on Monday, 30.10.2023)

In-Tutorial Exercise 1. Decide whether the following statements are true for all finite sets A, B, C or not. If yes, give an argument why, if not, give a counterexample.

1. $A = B \;\Rightarrow\; A \setminus B = \emptyset$.
2. $B \subset \mathfrak{P}(A) \;\Rightarrow\; B \notin \mathfrak{P}(A)$.
3. $|\mathfrak{P}(A)| > |A|$.
4. $A \setminus B = A \cap B^c$.

In-Tutorial Exercise 2. A pig farmer gets a price of €20 per pig this year. He fears subsidy reduction in the next year, which would lead to a price reduction to €12. If the subsidies will not be cut, then he expects the prices to rise to €24. The farmer has some savings that he wants to invest.

1. Explain why a put option is suitable for the farmer? Which other derivates may be suitable?
2. The bank offers the put option with price s and strike $12 < K < 24$. Which values of s lead to arbitrage opportunities?