Notation. Assumptions. Conventions.

Assumptions.

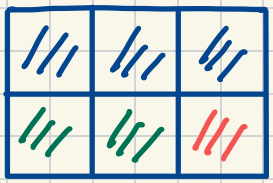
- There is a **single prevailing interest rate.**
  - the same for borrowing & lending
  - the same for everyone
  - **deterministic and constant**
- There is an **infinite line of credit.**
- **Money is continuously valued.**

e.g.) $100 e^{0.02 \cdot 2} = 100 e^{0.04} =$ _____

Note. Borrowing and lending via savings accounts, loans, bonds, ..., are all **RISKLESS INVESTMENTS.**

RISKLESS ASSET: governed by a fixed deterministic continuously compounded, risk-free interest rate r

RISKY ASSET:



We assume that shares of stock are **continuously valued**, e.g.

$\frac{11}{13}$ shares

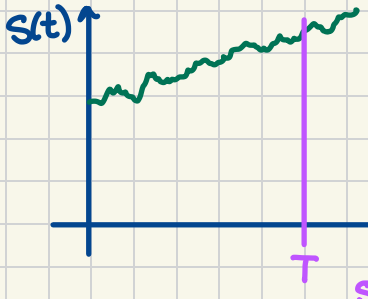
or

$e^{-0.07}$ shares

Return
- dividends
- stock appreciation

Dividends
- YES
  - DISCRETE
  - CONTINUOUS
- NO DIVIDENDS (This class?)

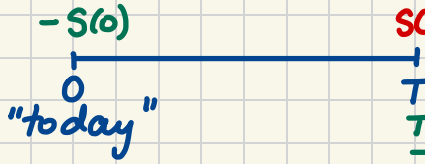
Outright Purchase of One Share of Stock.



$S(t), t \geq 0$ ... stock price

RANDOM PROCESS aka STOCHASTIC PROCESS

$S(T)$... a random variable.



$S(T)$... time-T stock price

TIME HORIZON

$$\text{SIMPLE RETURN} = \frac{S(t+1) - S(t)}{S(t)}$$