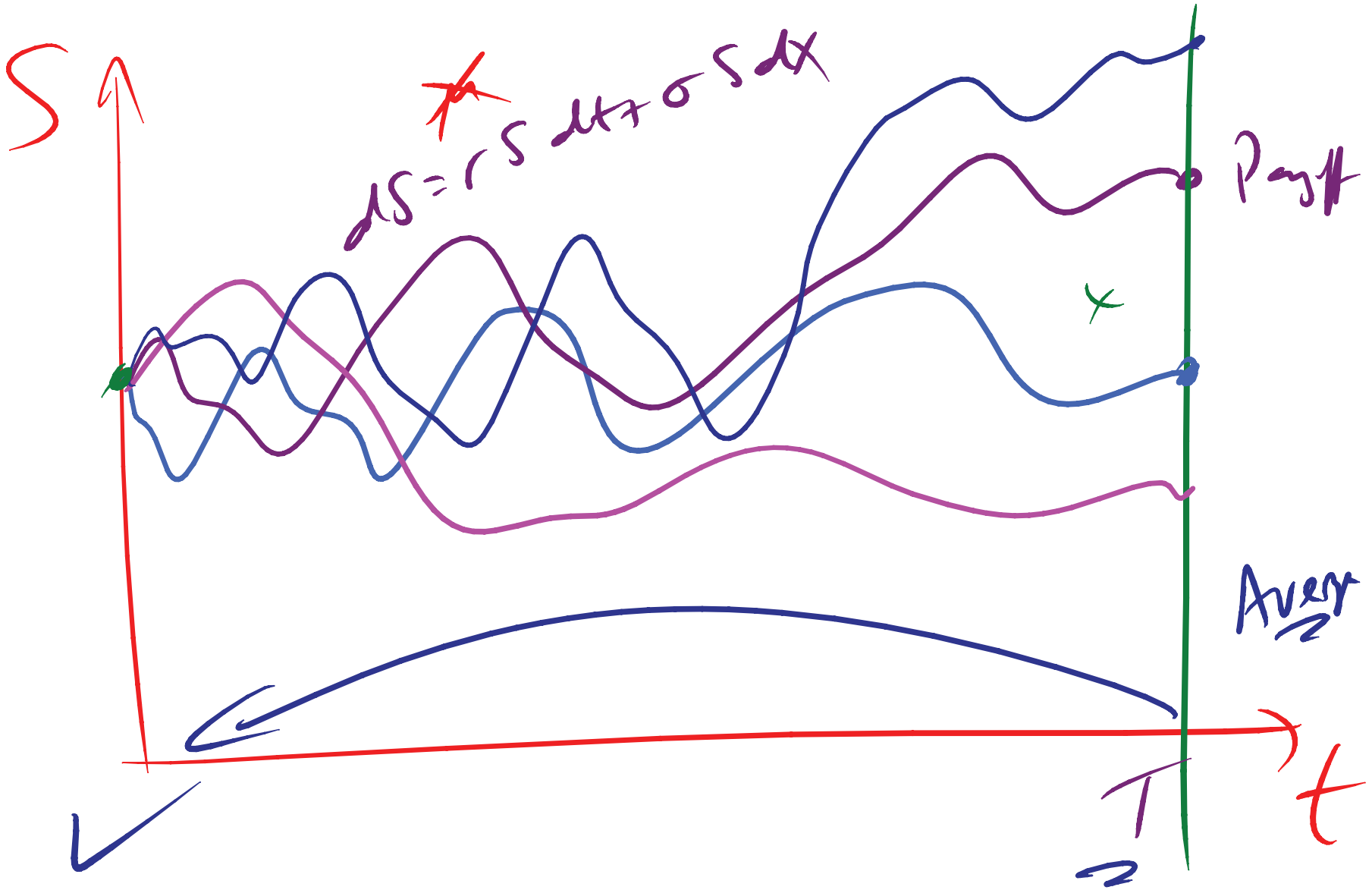
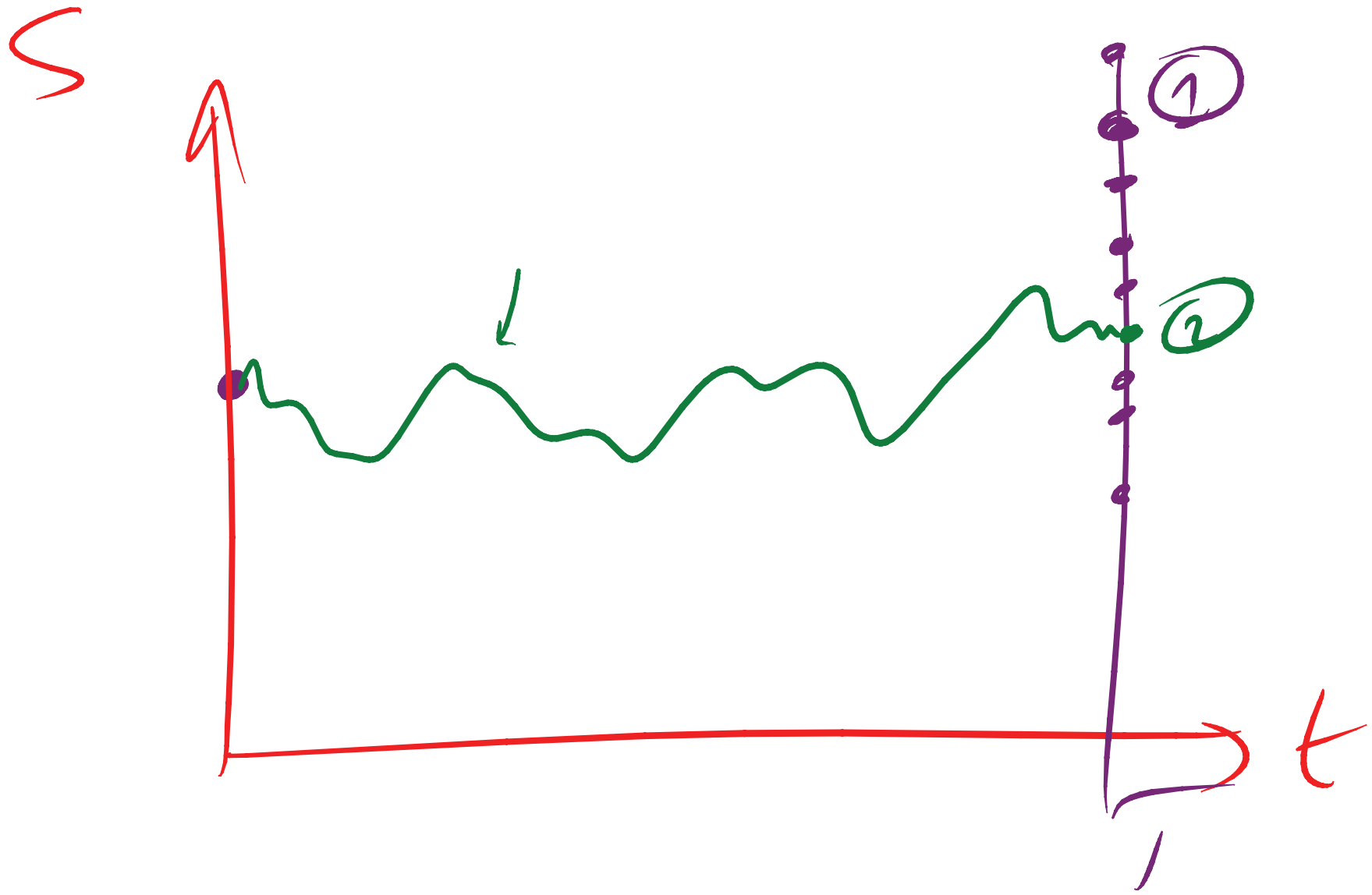
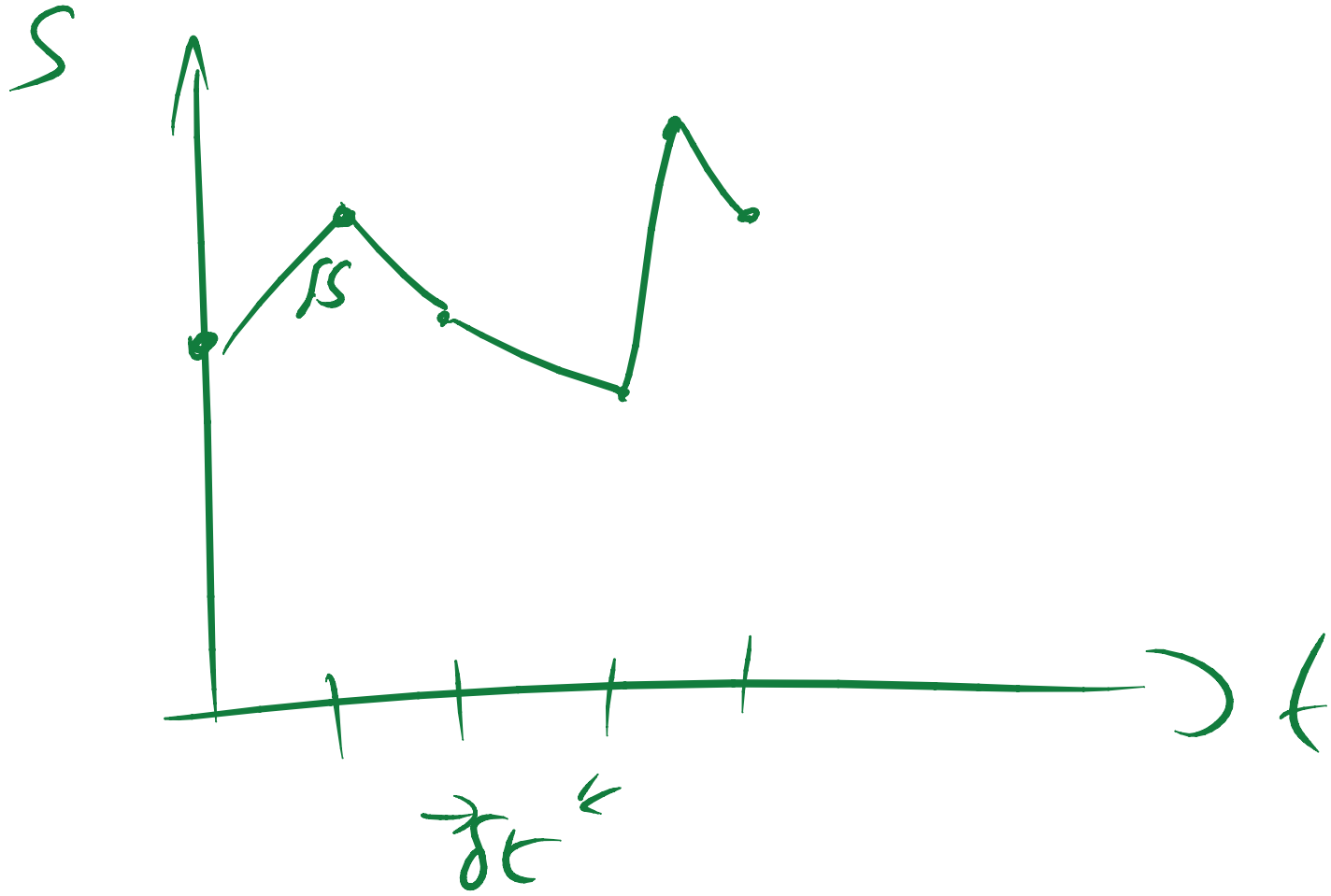
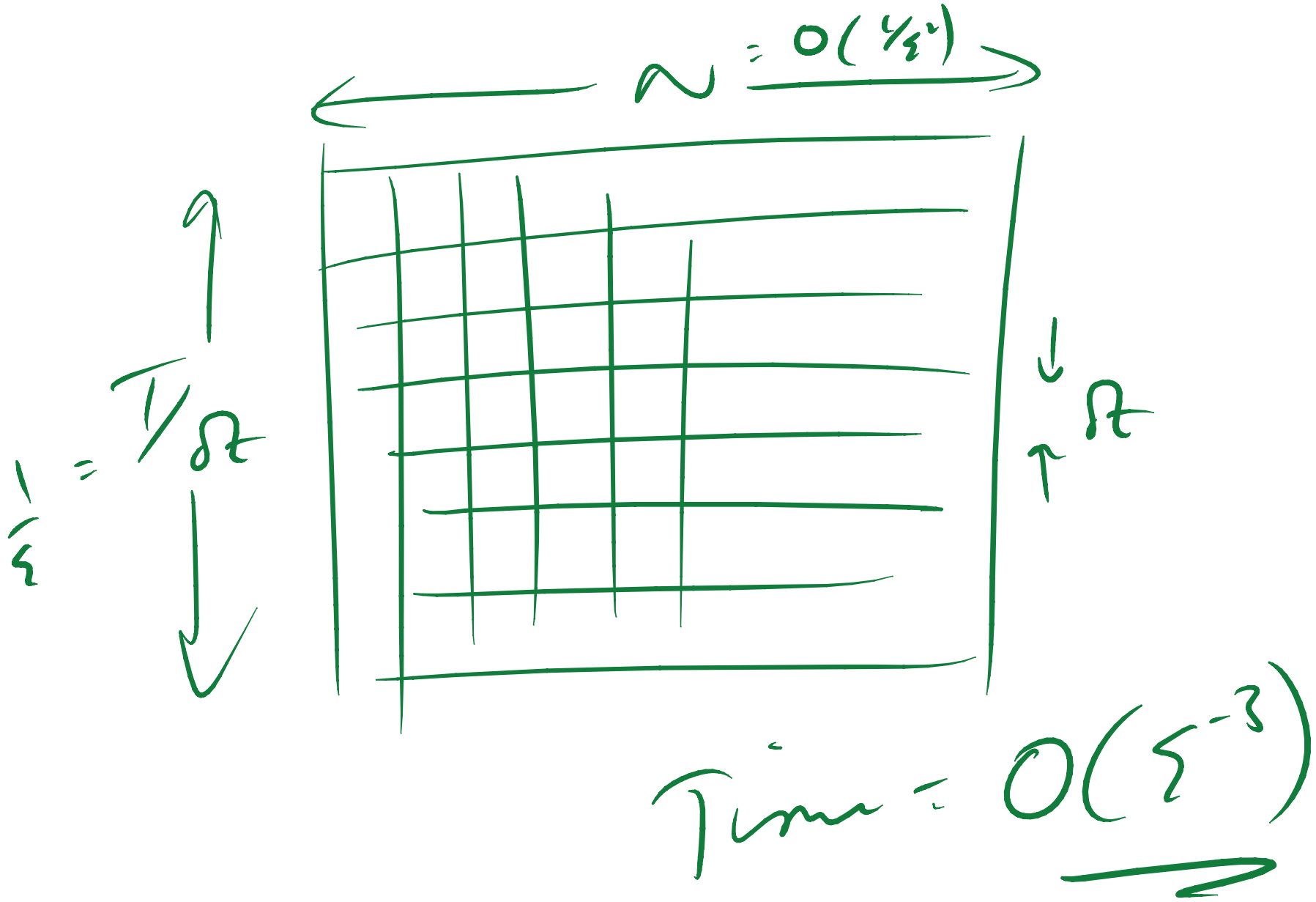
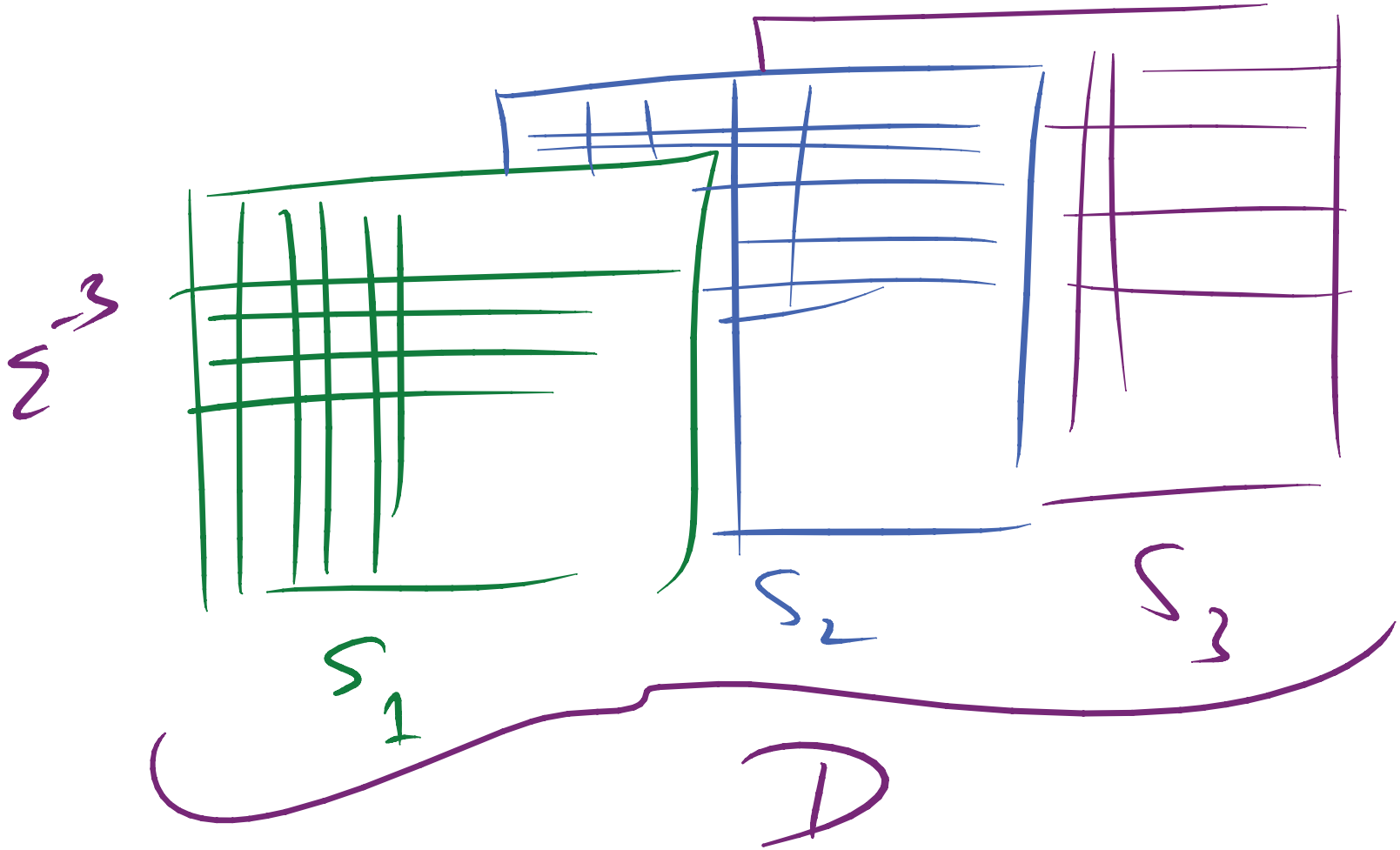
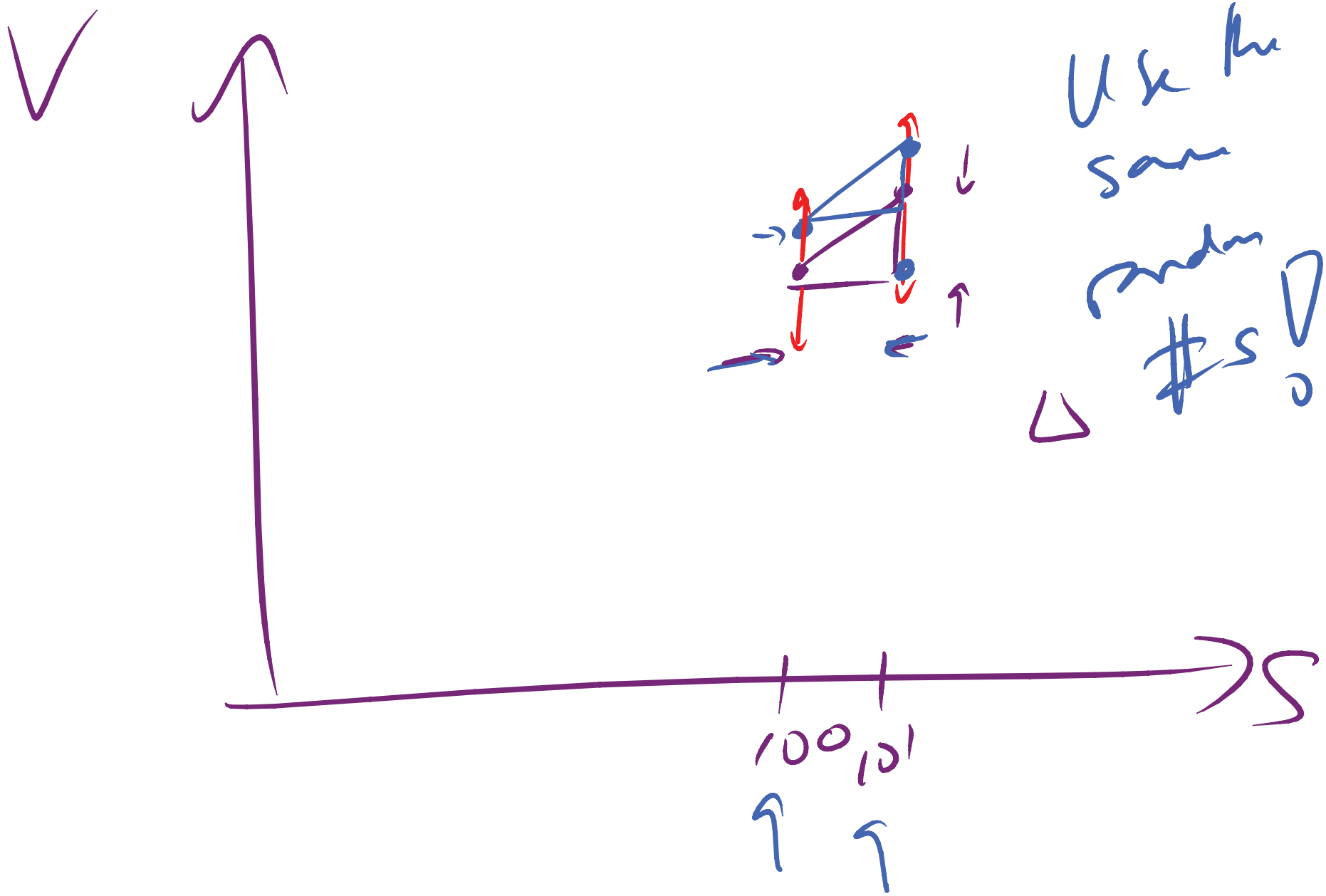

S
dS = rS dt + σS dX
Payoff
Aver
T
t

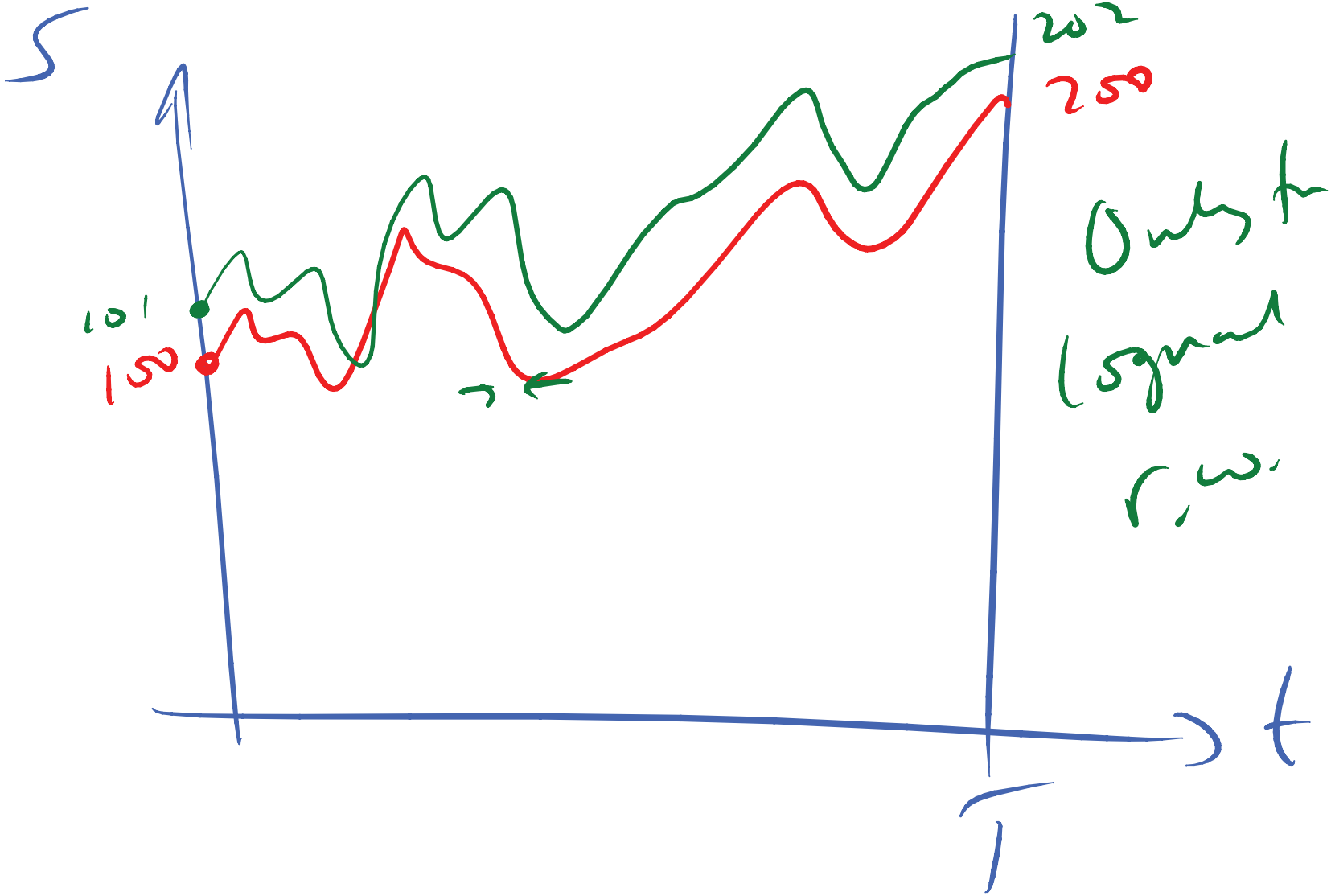

S
1
2
t
1

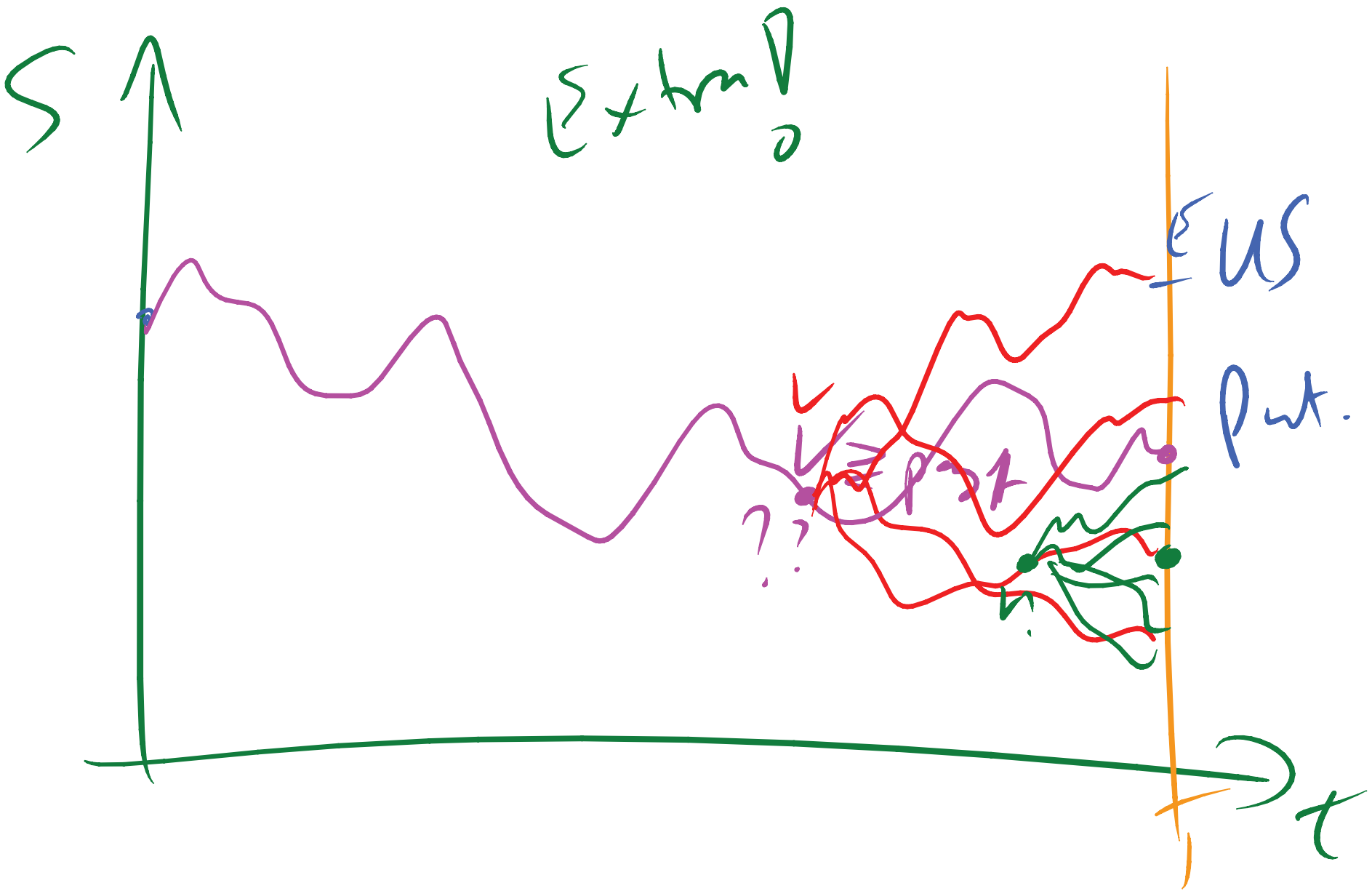

S
δS
t
δt


$\sim = O(1/\varepsilon)$
$1/\varepsilon = T/\delta t$
Ω
Time $= O(\varepsilon^{-3})$


Σ^{-3}
S_1
S_2
S_3
D


V
S
100
101
Use the same random #s!


S
202
250
101
150
t
T

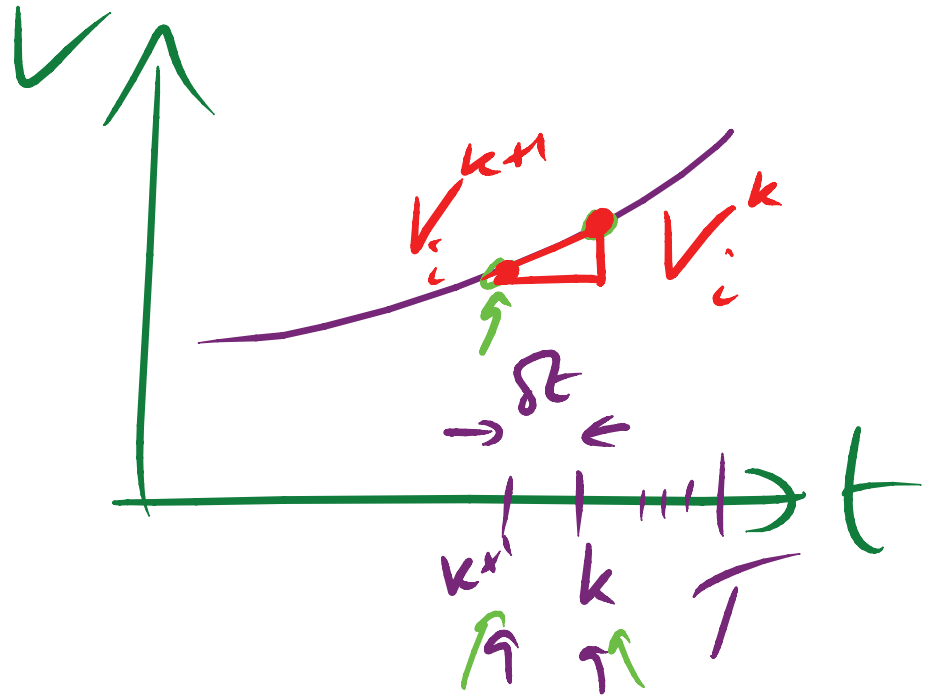

S
Extrap!
E US
Put.
??
t
T

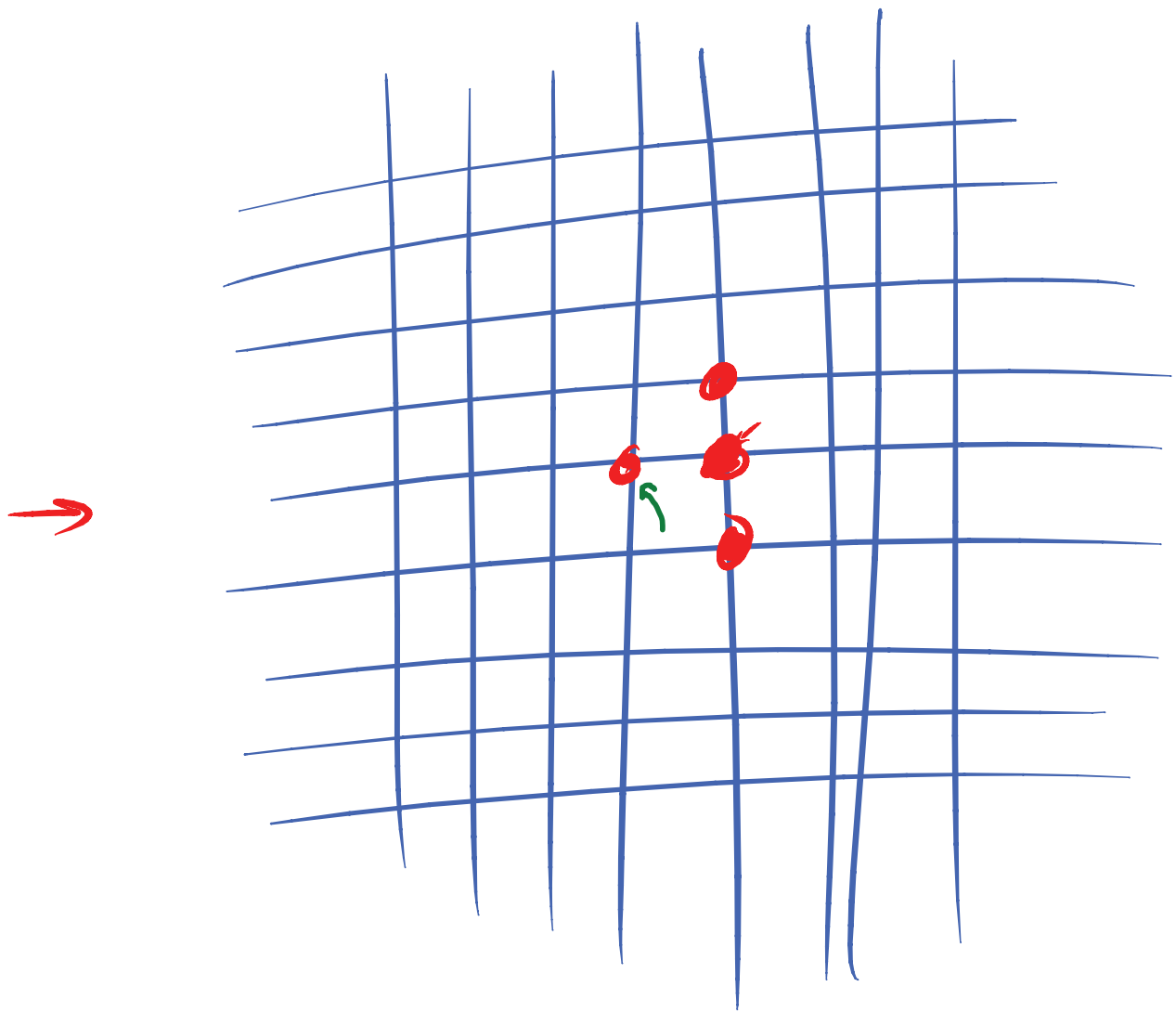
$$\frac{\partial V}{\partial t} + \frac{1}{2}\sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS\frac{\partial V}{\partial S} - rV = 0$$

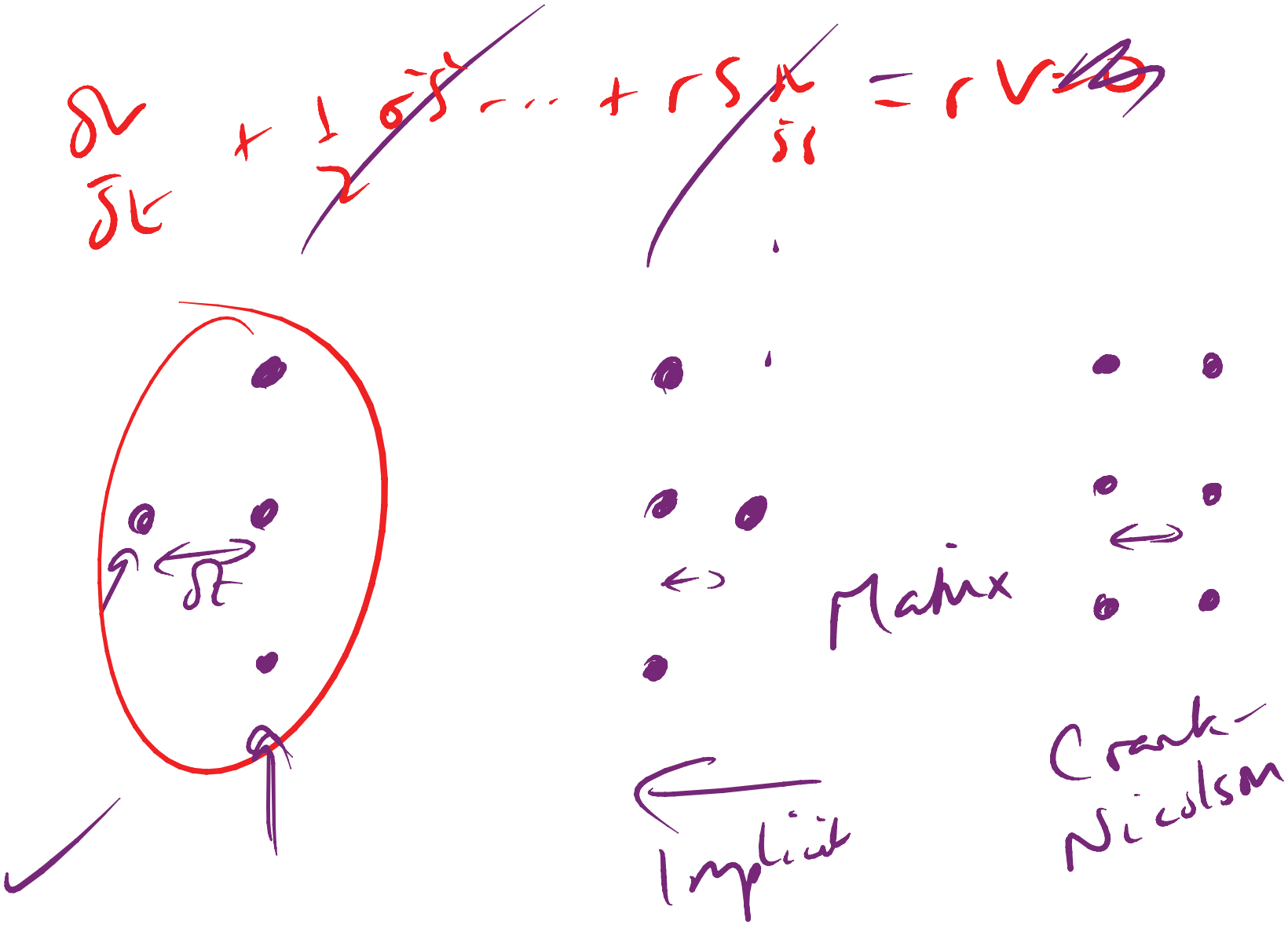
$$\theta \approx \frac{V_i^k - V_i^{k+1}}{\delta t}$$

$O(\delta t)$

$O(\delta S^2)$






Matrix
Implicit
Crank-
Nicolson

$$\delta t < \frac{1}{\sigma^2 N A S^2}$$


t
0
Δt
T

Richardson Extrapolation

1911

E_{mm} $O(\delta s^2)$ $O(\delta t)$

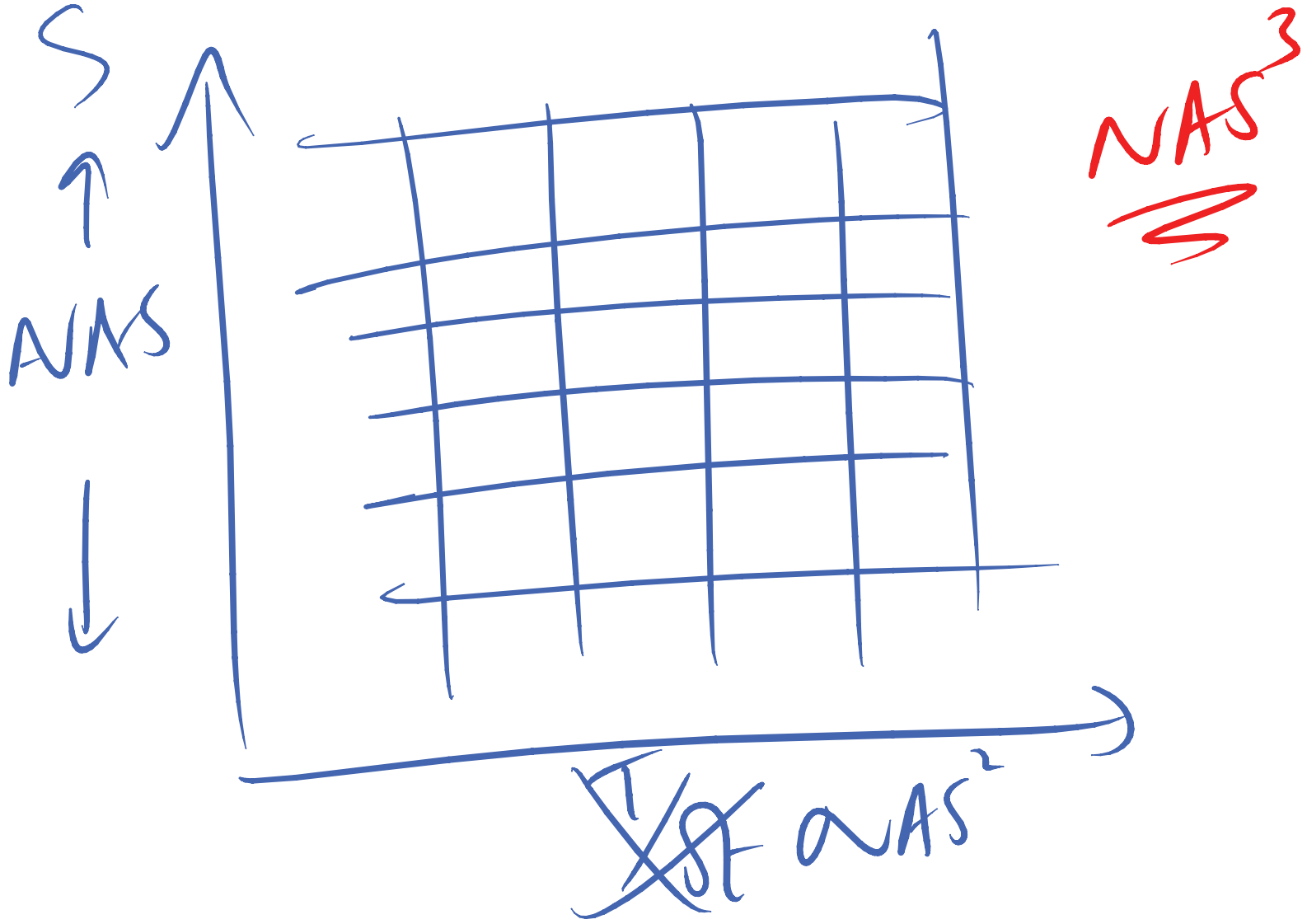
$O(\delta s^2)$

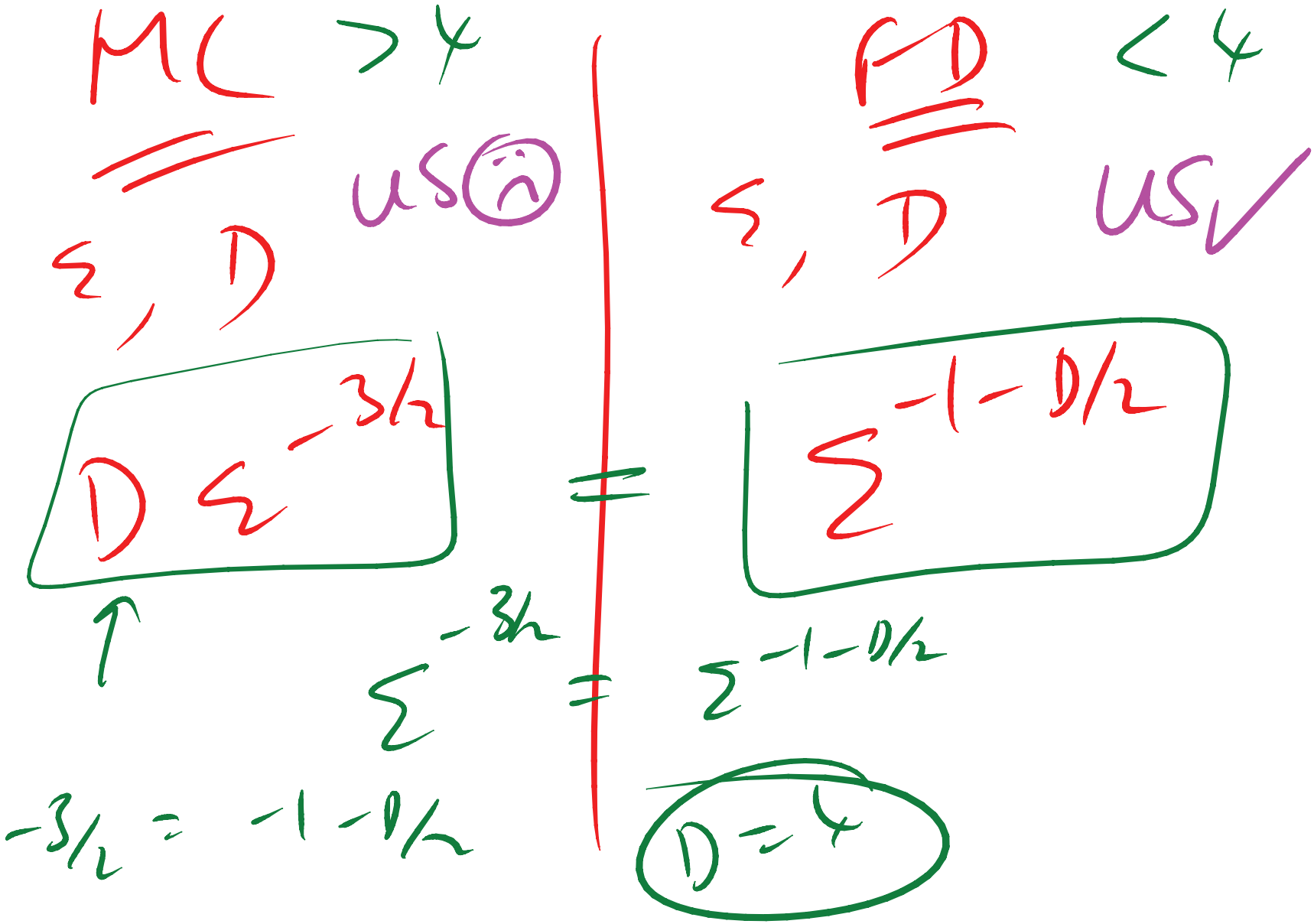
$$V(NAS) = V_{exact} + \frac{\alpha}{NAS^2} + \cdots$$

$$V(2\delta) = V_{exact} + \frac{\alpha}{2\delta^2} + \cdots$$

$$4V(\delta) = 4V_{exact} + 4\frac{\alpha}{\delta^2} + \cdots$$

$$\frac{4V(\delta) - V(2\delta)}{3} = V_{exact} + \cdots$$


S
NAS
NAS³
T/SF ∝ AS²


MC > 4
FD < 4
ξ, D
ξ, D
$D\xi^{-3/2}$
$\Sigma^{-1-D/2}$
$\Sigma^{-3/2} = \Sigma^{-1-D/2}$
$-3/2 = -1-D/2$
$D = 4$

Sound very soon!

No live video...

but it will be there on

the recording.

Any minute now!!