

# The Wiener Process/Brownian Motion

Continuous

Given :  $t_1 < t_2 < t_3 \dots$   
 $W_{t_1}, W_{t_2} - W_{t_1}, W_{t_3} - W_{t_2}, \dots$   
are independent

$W_t$

$W_t - W_s \sim N(0, t - s)$

$W_0 = 0$   
 $0 < t < T$

Fundamental Building Block of Stochastic Calculus

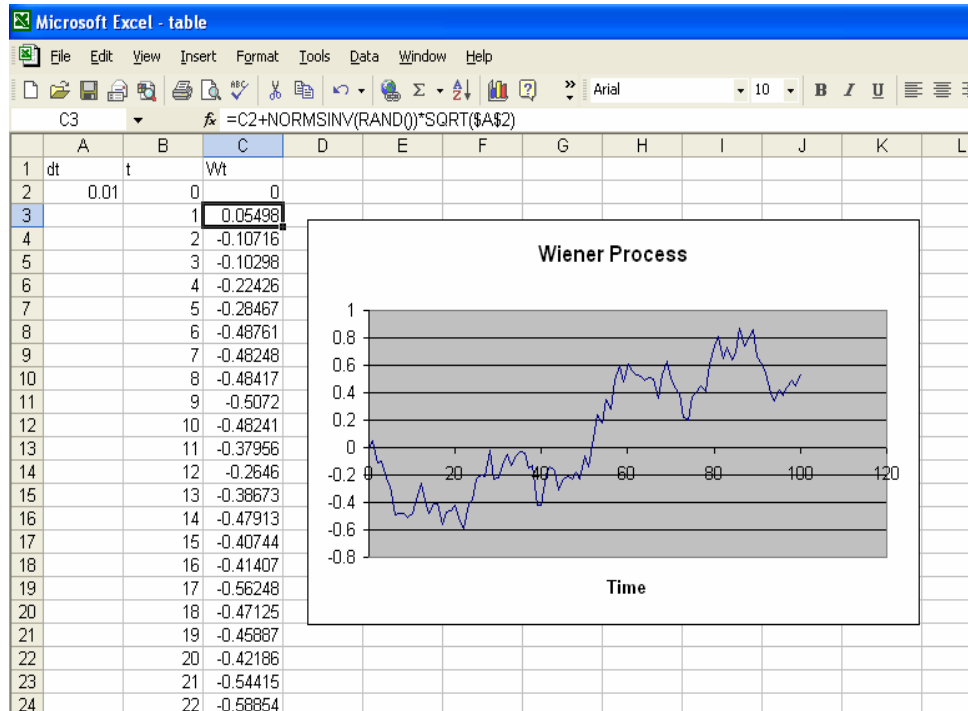
# See for yourself with Excel

## Algorithm

$$W_0 = 0$$

$Z \sim N(0,1)$ , standard normal distribution

$$W_{(i+1)dt} = W_{idt} + \sqrt{dt} \times Z$$



# What's the distribution?

