The uncertainty principle states that

$$\Delta x \Delta p \geq \frac{\hbar}{2} \tag{1}$$

where Δx represents the uncertainty in a measurement of position, and Δp represents uncertainty in measurement of momentum. (momentum = mass x speed)

The uncertainty principle tells us that if one knows the exact position of a particle [1] (hence Δx is very small) then the uncertainty in the momentum of a particle becomes very large. Hence, one *cannot* know both the position and momentum of a particle at the same time. Therefore one cannot determine exactly how the particle will move, as one needs to know both its momentum and its position to achieve this.

Determinism (as I loosely understand it) says that, if we were clever enough, we could measure the position and momentum of every particle in the world and then from that we could calculate how every particle would move and therefore everything that would happen in the world, including all our decisions.

However, the uncertainty principle shows this to be untrue as we cannot know the position and momentum of every particle in the universe. Nature has an intinsic unpredictability about it.

[1] By particle I mean anything really. You could think of them as say molecules in a gas. The movement of molecules in a gas will determine its properties