# Fly faster? Fly shorter!
A glance at mathematics in cartography

Since ancient times, mankind felt the need to understand the surrounding world and to represent it. This gave birth to cartography, a collection of scientific and technical knowledge, necessary to faithfully reproduce portions of our planet.

Cartography evolved over time, not only thanks to scientific and geographical discoveries, but also to socio-political developments of various historical periods; different maps have been invented in order to answer new and specific human needs. Some of these charts became obsolete, some others still keep their utility nowadays.

An example is the famous Mercator map that completely revolutionized the nautical world for the simplicity with which it made sailors able to trace and follow naval routes using just a ruler and a compass, with no need for difficult calculations.

Mercator chart is great for tracing routes while at sea, but has obvious disadvantages: for example, areas of the continents do not reflect their real proportions and shapes and it only represents a portion of the Earth.
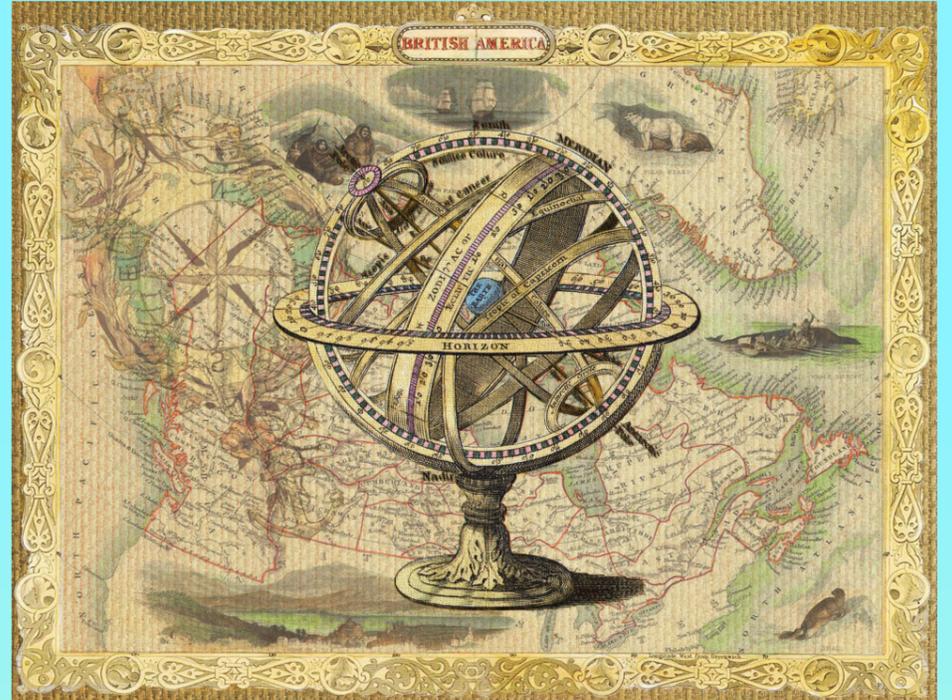
Just like the map of Mercator, often a new map is created with the attempt to capture a feature of the geometry of the sphere while neglecting some others peculiarity.

If cartography is so important and has so ancient origins, why do we continue to use so many different maps? Is it possible to find a perfect map?

We can answer this question thanks to a mathematical result: Gauss's Egregium Theorem, which tells us that the perfect map does not exist and that… to be mathematically correct, we must carry a globe in our pockets!