HOMEWORK #1
Due date: Jan 21, 2015

1. Michael decides to set the world record in free swimming and he sets off Cape May, USA to Dakar, Senegal. What is the shortest length of his swimming path? Given that Michael can swim $1\,\mathrm{m}$ per second, how long will he be swimming? Sketch his swimming path and compute all angles and sides. Look up geographic coordinates of Cape May and Dakar online.

2. Two ships, USS Griffin and USS Valerie, are steaming along the parallels of latitude $48°\,\mathrm{N}$ and $15°\,\mathrm{S}$ respectively, in such a way that at any given moment the two ships are on the same meridian of longitude. If the speed of USS Griffin is 15 knots, find the speed of USS Valerie.

3. RMS Titanic sunk at $\phi = 41°43'32''\,\mathrm{N}$, $\lambda = 49°56'49''\,\mathrm{W}$. It traveled from Southampton ($\phi = 50°54'18''\,\mathrm{N}$, $\lambda = 1°24'12''\,\mathrm{W}$) to New York ($\phi = 40°16'12''\,\mathrm{N}$, $\lambda = 73°58'48''\,\mathrm{W}$). Was this point on the shortest path between the two cities?

4. Amanda and Rob are traveling by plane; Amanda flies from Philadelphia to Cancun, and Rob flies from Philadelphia to Los Angeles. They are arguing about who had a longer flight. Google for geographic latitudes and longitudes of these cities, and resolve their argument. While at it, compute the shortest distance between Rob and Amanda while they are at their destinations.

5. USS Connor steams from $\phi = 39°20'00''\,\mathrm{S}$, $\lambda = 110°10'00''\,\mathrm{E}$ to $\phi = 44°30'00''\,\mathrm{S}$, $\lambda = 46°20'00''\,\mathrm{W}$. What is the shortest possible route between those two points if USS Connor cannot cross the $62°\,\mathrm{S}$ parallel?

6. *Extra credit:* In a spherical triangle ABC, $C = 90°$, $a = 119°46'36''$ and $B = 52°25'38''$. Compute the values of b, c and A.