

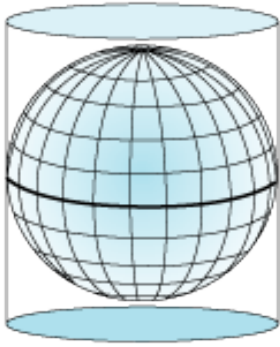


**Explain your answers with neat sketches when applicable. Assume all computations are made on Helmert1906**  
**( $a = 6378.2 \text{ km}$ ,  $f = \frac{1}{298.3}$ ). Also, mean radius of the earth is  $R = 6371 \text{ km}$ .**

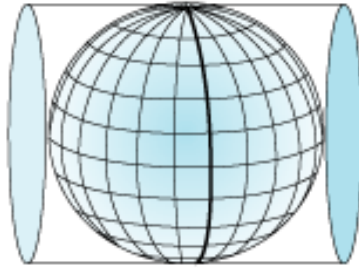
### **Assignment (2) – Introduction to Map Projection**

1. Using your own words define the term “map projection”.
2. Express your thoughts about why the sentence “There is no right answer” is raised in map projection.
3. Express your views with justification about the following: -
  - a. In a tangential projection, scale factor at central meridian is always greater than 1.
  - b. A secant projection, there is no distortion at central meridian.
  - c. Azimuthal projection preserves the distances between certain points on the map.
  - d. Mathematical projection is based on the central point (light source) of projection.
  - e. Tangential projection coincides with the projection surface at a single point.
  - f. Secant projection intersects the projection surface at two standard parallels.
  - g. Transverse projection is oriented along a line of longitude (e.g., GW).
  - h. Conformal projection preserves the relative **sizes** of regions on the map.
  - i. Convergence of meridians is one of the geometric reductions in geodesy.
4. Discuss the classification of map projections based on their properties and characteristics.
5. Explain the concept of scale factor in map projections. How does it relate to distortion?
6. What are the basic types of distortions in map projection?
7. Why does the issue of distortion arise when creating a map of the Earth's surface?
8. Discuss why it is impossible to create a completely accurate map (ideal map) of the Earth's surface?
9. How do different map projections vary in terms of their ability to accurately represent global properties? For example, how equal area differs from conformal.

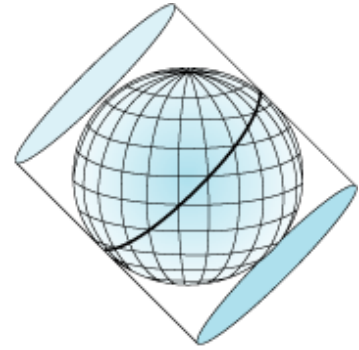
10. Label each of the following map projections: -



a



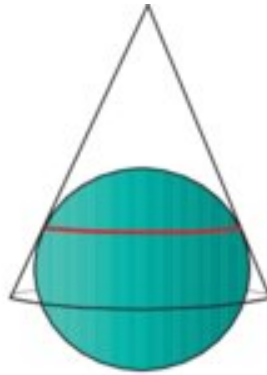
b



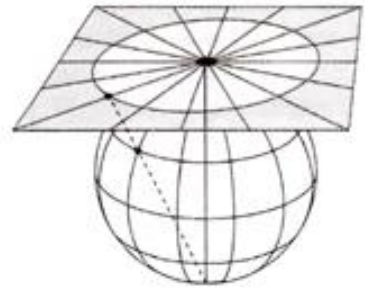
c



d



e



f



g



h



i