

Exercises 2.2

1. Determine and discuss the most appropriate representative fractions for the following verbal map scale descriptions: individual, neighborhood, urban, regional, national, and global.
2. Go to the National Atlas website and read about map projections

(http://nationalatlas.gov/articles/mapping/a_projections.html). Define the following terms: datum, developable surface, secant, azimuth, rhumb line, and zenithal.

Datum- A datum defines how a coordinate system is seated over the ellipsoid. The origin of the new NAD83 system is the centre of mass of the Earth, whereas the old North American Datum 1927 (NAD27) had a different origin, making it useful only in North America.

developable - developable surface. [map projections] A geometric shape such as a cone, cylinder, or plane that can be flattened without being distorted. Many map projections are classified in terms of these shapes

surface - Surface maps usually represent real-world entities such as landforms or the surfaces of objects. They can, however, serve as an abstraction where the third, or even all of the dimensions correspond to non-spatial data. In this capacity they act more as graphs than maps.

secant - In map projections, the secant line is the line at which the developable surface of a conic or cylindrical projection "slices" through the sphere of the earth. This is opposed to a tangent line, where the developable surface only touches the sphere of the earth at one line.

azimuth - The azimuthal equidistant projection is an azimuthal map projection. It has the useful properties that all points on the map are at proportionally correct distances from the center point, and that all points on the map are at the correct azimuth (direction) from the center point.

rhumb - In navigation, a rhumb line (or loxodrome) is a line crossing all meridians of longitude at the same angle, i.e. a straight line path derived from a defined initial bearing.

zenithal - a type of map projection in which part of the earth's surface is projected onto a plane tangential to it, either at one of the poles (polar zenithal), at the equator (equatorial zenithal), or between (oblique zenithal)

3. Describe the general properties of the following projections: Universal Transverse Mercator (UTM), State plane system, and Robinson projection.

UTM - The Universal Transverse Mercator (UTM) coordinate system is a specialized application of the transverse Mercator projection. The world is divided into 60 north and south zones, each six degrees wide. Each zone has its own central meridian and a scale factor of 0.9996. Zones 1N and 1S start at 180° west.

State plane system- The State Plane Coordinate System (SPCS), which is only used in the United States, is a plane coordinate system (north-south and east-west lines are perpendicular) in which each individual state has between one to six zones, depending on the state's size and shape.

Robinson projection- The Robinson projection is neither conformal nor equal-area. It generally distorts shapes, areas, distances, directions, and angles. The distortion patterns are similar to common compromise pseudocylindrical projections. Area distortion grows with latitude and does not change with longitude.

4. What are the scale, projection, and contour interval of the USGS topographic map that you downloaded for your place of residence?

Surigao city

scale = 1:18,056

projection =

contour interval =

5. Find the latitude and longitude of your hometown. Explain how you can convert the coordinates from DD to DMS or vice versa.

Lat: 9° 46' 4" N

Long: 125° 29' 30" E

For the degrees use the whole number part of the decimal. For the minutes multiply the remaining decimal by 60. Use the whole number part of the answer as minutes. For the seconds multiply the new remaining decimal by 60.