

Lab 2: Coordinates on a Topographic map

By

Rebaz M Qader

Coordinates system

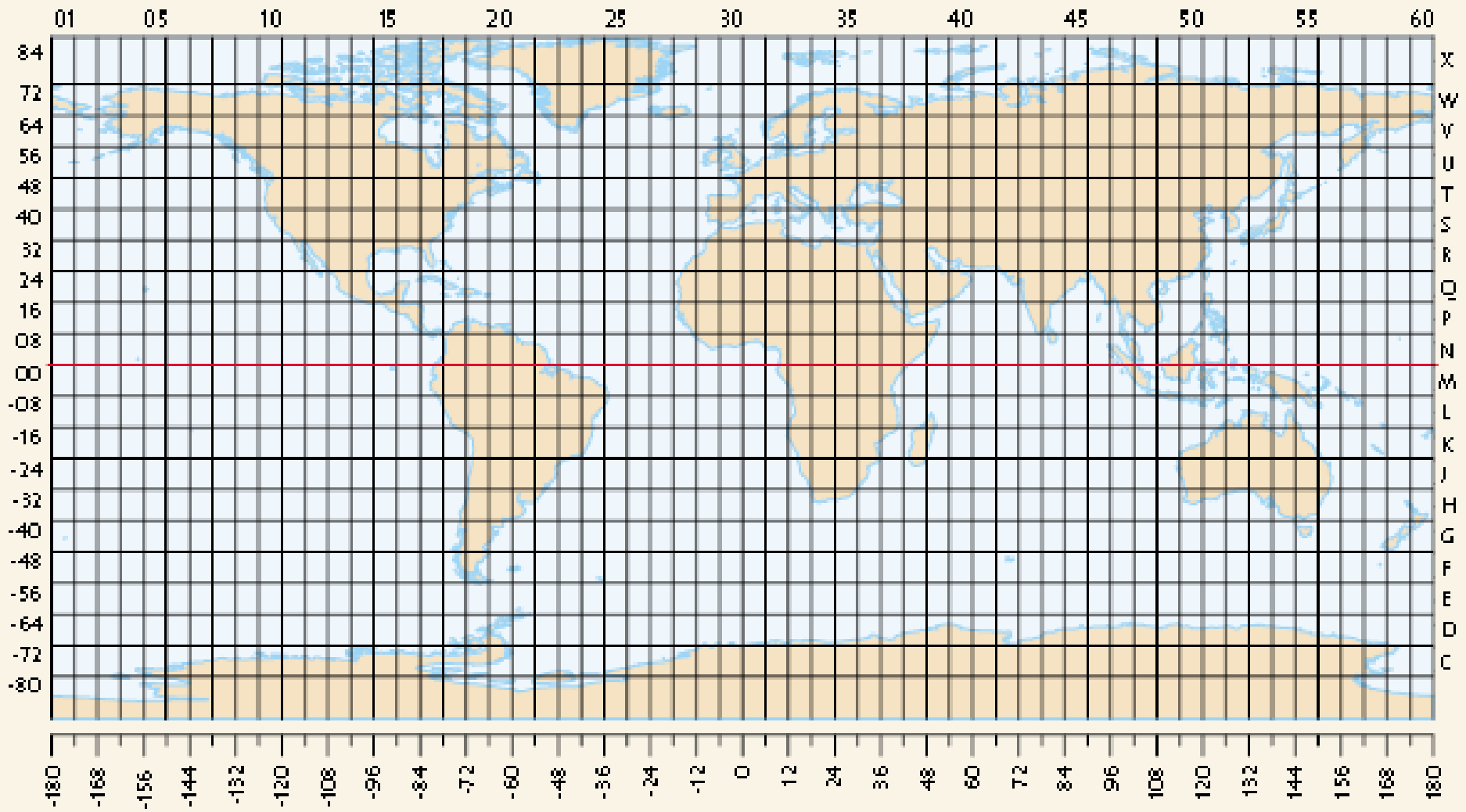
Coordinate Systems:

There are many different systems for specifying positions on the earth's surface.

The most commonly used coordinate systems are:

- The first method is degrees-minutes-seconds (latitude and longitude)
- Universal Transverse Mercator UTM

UTM



UTM grid showing Zone Numbers, 1 – 60, and Zone Characters, C – X

Latitude and Longitude

- The equator is assigned 0 degrees latitude. Latitude increases as one gets closer to a pole. The north pole has a latitude of 90° North and the south pole has a latitude of 90° S. Note that while latitude lines run east-west, they measure all positions relative to north-south
- Longitude lines run around the earth in a north-south direction through the poles, but they measure distance east-west of the Prime Meridian
- The Prime Meridian passes through Greenwich, England, a city near London. The Prime Meridian is assigned 0° longitude. Longitude values increase from 0° to 180° as one moves east of the Prime Meridian and decrease from 0° to -180° to the west. They may also be represented as 0 E to 180 E and 0 W to 180 W

Latitude and Longitude

Therefore , Latitude is the distance north or south of the equator.

Longitude is the distance east or west of the prime meridian (Greenwich, England). Latitude and longitude are measured in seconds, minutes, and degrees:

$$1' \text{ (minute)} = 60'' \text{ (seconds)}$$

$$1^\circ \text{ (degree)} = 60' \text{ (minutes)}$$

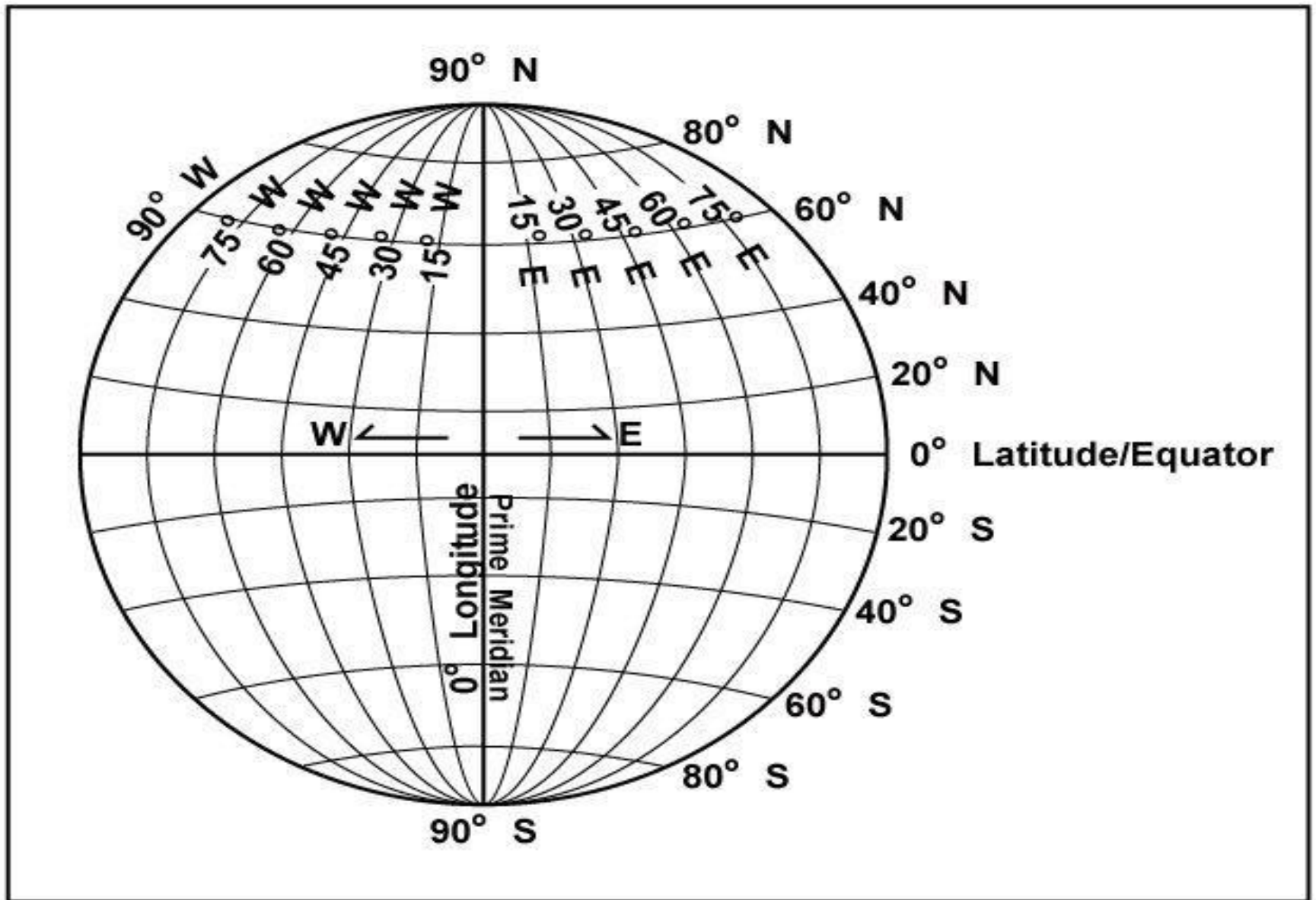


Figure 1: The globe and longitude/latitude.

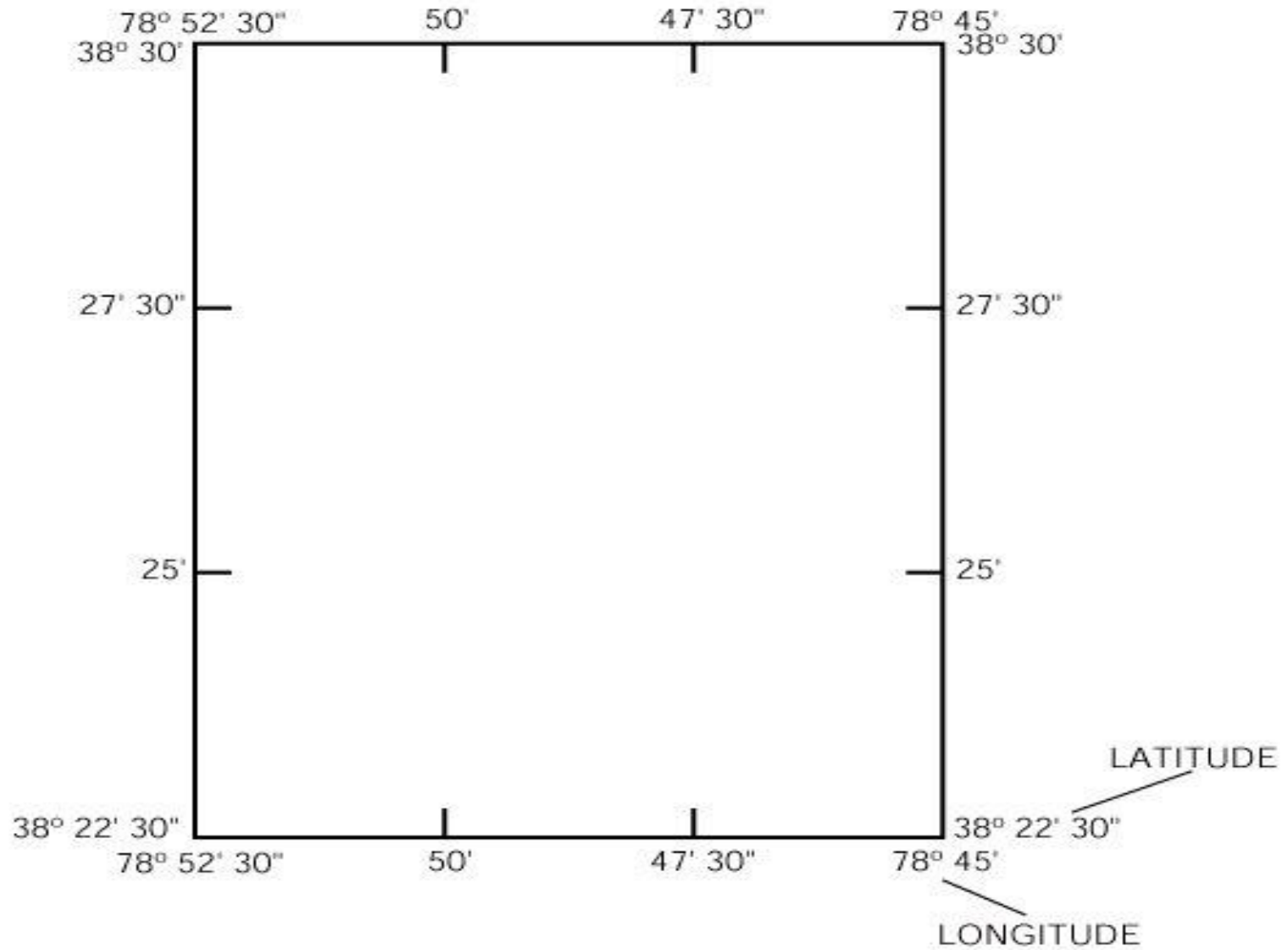


Figure 2: Latitude and longitude values as presented on a topographic map.

Coordinates system

Actual determination of longitude/latitude points on a map requires:

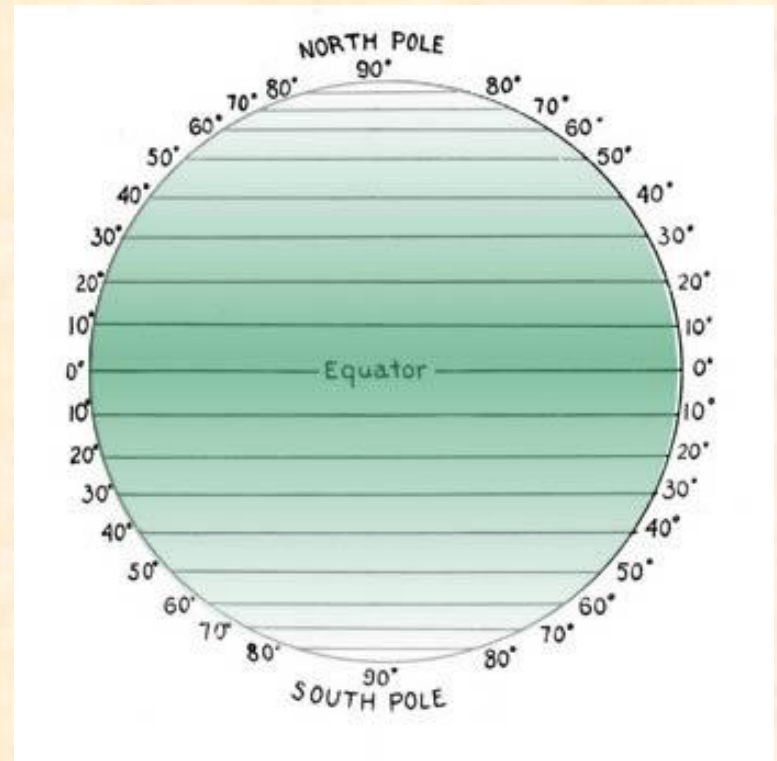
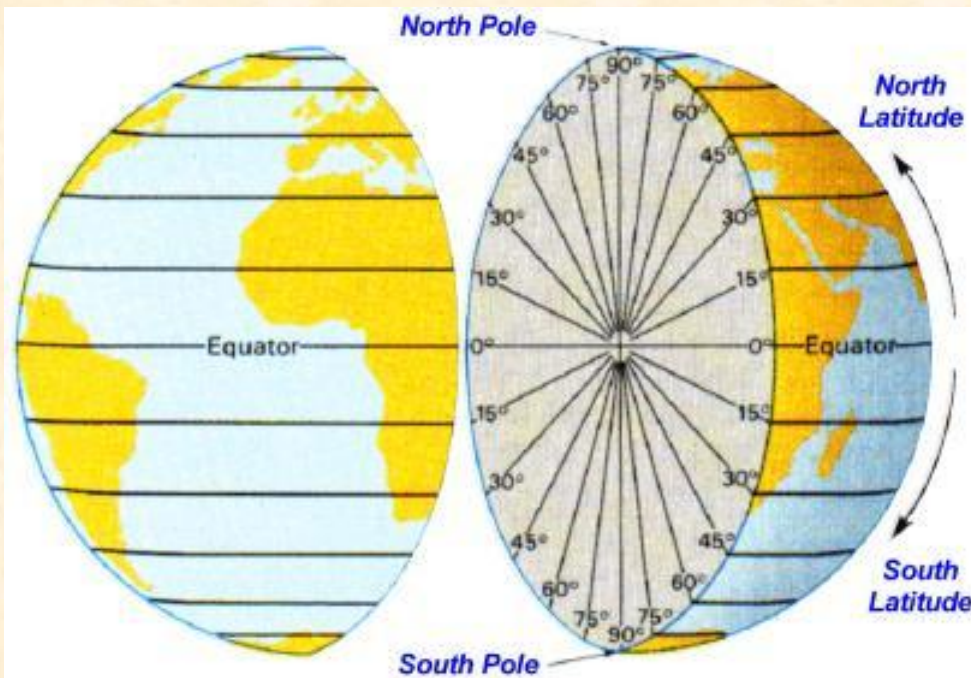
1. Finding reference ticks on the map with given values of longitude and/or latitude that lie on both sides of the point of interest..
2. Measurement, with a ruler, of the location of the point of interest relative to the reference ticks.
3. Algebraic solution of the points latitude and longitude.

Lab2: Exercise

- Determine the longitude and latitude for X538, X328, X590 and X522 on the map?
- Define the direction of the map (NE, SE, SW or NW) based on longitude and latitude value?

Latitude and Longitude

- Latitude
 - Measured in degrees North and South of the Equator.
 - Lines drawn parallel to each other running west to east.



Latitude and Longitude

Longitude:

- Measured in degrees East or West of the prime meridian.
- Lines drawn running North and South.

