

o'clock in the evening at Greenwich it would be eight at Mount Etna and nine at Alexandria.

When two places are both east or both west of Greenwich their difference of longitude is found by subtraction. Exercise 1. Find the difference of longitude between the places where longitudes are 15° E., 45° E., $54^{\circ} 30'$ E., $98^{\circ} 45'$ E., $154^{\circ} 30'$ E., $178^{\circ} 15'$ E. Observe that there are fifteen differences to find.

If one place be east of Greenwich and another west of it, it is plain that the difference of longitude is the sum of the longitudes given.

Exercise 2. Find the difference of longitude between 13° E., 28° W., $14^{\circ} 15'$ E., $37^{\circ} 30'$ W., $48^{\circ} 45'$ E., $75^{\circ} 15'$ W., $100^{\circ} 30'$ E. Here there are twenty-one differences to find.

When the differences of longitude of two places as found by addition exceeds 180° , they approach one another on the other side of the earth, and their difference of longitude must be corrected by subtracting the amount from 360° .

Exercise 3. Find the differences of longitude between $87^{\circ} 14'$ E., $105^{\circ} 47'$ W., $94^{\circ} 53'$ E., $126^{\circ} 17'$ W., $103^{\circ} 29'$ E., $140^{\circ} 33'$ W., $119^{\circ} 48'$ E., $150^{\circ} 16'$ W., $134^{\circ} 25'$ E., $162^{\circ} 31'$ W., $159^{\circ} 43'$ E., $170^{\circ} 58'$ W., $165^{\circ} 14'$ E., $178^{\circ} 40'$ E.

The difference of longitude between two places expressed in degrees, divided by fifteen, will give the difference of time expressed in hours, because the equidistant meridians which are crossed in succession by the sun at intervals of an hour are as shown above 15° apart. Thus if the difference of longitude of two places be 90° , the difference of time will be six hours; if the difference of longitude be $37^{\circ} 15'$, the difference of time will be two hours twenty-nine minutes.

It will help in the calculation to remember that each degree of difference of longitude corresponds to four minutes in time, and each minute of difference in longitude corresponds to four seconds in time.

Exercise 4. Reduce all the differences of longitude in the above examples to differences of time.

Exercise 5. Find the differences of time between New York, Montreal, Rio Janeiro, Havana, Valparaiso, San Francisco, Victoria, Yokohama, Pekin, Calcutta, Adelaide, Cape Town, St. Petersburg, Paris.