Decimal – Sexagesimal Conversion in 2010

We shall give an actual modern day example in which one needs to convert decimal fractions into approximate base **60** terms, at least to two places**.** Here is a typical entry from the U. S. Geological Survey site

http://quake.usgs.gov/recenteqs/Quakes/quakes0.htm

describing a minor earthquake in Southern California**:**

map 2.0 2010/03/30 06:58:11 33.785 N 116.155W 4.2 10 km (6 mi) NE of Indio, CA

Note that the location is given by degrees expressed in decimal terms**.** Suppose now that you want to locate the center of the earthquake precisely using something like **Google Earth.** This program has a very high resolution**,** and one can use it to get an extremely accurate visual representation of where the earthquake took place (easily within **100** meters or yards)**.** Unfortunately**, Google Earth** expresses locations by degrees**,** minutes**,** and seconds**,** where the seconds are expressed in decimal terms**.** Thus one needs to carry out a conversion in order to locate the center of the earthquake using the USGS data together with **Google Earth.** We shall go through this process for the earthquake listed above**.**

LATITUDE: This is given as **33.785** degrees north**.** To obtain the number of minutes, we need to multiply **0.785** by **60** and take the integral part of the product**.** Now the product in question is **47.1**, so the number of minutes is **47.** To find the number of seconds**,** we multiply the fractional part of **47.1** by **60;** since this fractional part is **0.1,** we obtain a value of **6.** Therefore the latitude is **33** degrees**,** **47** minutes and **6.0** seconds**.**

LONGITUDE: This is given as **116.155** degrees west**.** To obtain the number of minutes, we need to multiply **0.155** by **60** and take the integral part of the product**.** Now the product in question is **9.3**, so the number of minutes is **9.** To find the number of seconds**,** we multiply the fractional part of **9.3** by **60;** since this fractional part is **0.3,** we obtain a value of **18.** Therefore the latitude is **116** degrees**,** **9** minutes and **18.0** seconds**.**