MONT 109N – Mathematics Across Cultures
Problem Set 2 – Mayan calendar calculations
Due: Friday, February 18

Note: You may check your work on these questions using the Mayan Calendar Converter link on the course homepage. But, you must show enough details to justify your answer completely to get full credit on these questions.

A. In the Mayan Calendar Round, as I am writing this problem set on Tuesday, February 8, today is *11 Eznab 11 Pax*.

1) What will the Calendar Round date be on the day this assignment is due: Friday, February 18, 2011? (Justify your answer using modular arithmetic calculations.)
2) What will the Calendar Round date be on Saturday, February 18, 2012? (Justify your answer using modular arithmetic calculations.)

B. The *Leiden Plaque* is a carved jadeite ornament from the early Classic period that shows

- on the front, an elaborately costumed king standing on a captive (soon to be a sacrificial victim, apparently!)
- an inscribed Long Count date on the rear.

The plaque is thought to be a record of the start of the reign of one of the kings of the city of Tikal in the Mayan heartland. There is a link to a hand-drawn reproduction of the date on the course home page.

1) Look it up there and decipher the date (the numbers of baktuns, katuns, tuns, uinals, days since the starting date of the current Great Cycle. Note: these numbers always appear after a large "Initial Series Introduction Glyph" at the top, and are read in the order given above, top to bottom. Express your answer as a date in the form *baktuns.katuns.tuns.uinals.days*, and as a total number of days since the start of the current Great Cycle. (If your translation is correct, the Calendar Round date on the day recorded should be *1 Eb 20 Xul* or *1 Eb 0 Yaxkin*, using the Mayans' convention that the 20th day of a month is the "seating" of the next month, written as 0).
2) Give a rough estimate of the date of the plaque in *our calendar system*, using the standard start date of the Long Count in the year 3114 BCE. *Note: This is one of the earliest known Long Count dates that has survived.*
3) (Extra Credit) If you look carefully, you can see the Calendar Round date *1 Eb 0 Yaxkin* on the Leiden plaque inscription too. Where are the corresponding glyphs on the plaque? Note: The glyphs for the Sacred Round and Vague Year "months" are reproduced in lots of places on line.

C. February 8, 2011 corresponds to the Long Count date 12.19.18.1.18. Recall that there are 20 days in a uinal, 18 uinals in a tun, 20 tuns in a katun, and 20 katuns in a baktun. The completion of the current Great Cycle (when the Long Count date reaches 13.0.0.0.0) is coming up quite soon(!) On what date (month, day, year) in our calendar will this occur?