Math 181
Day 21 Notes

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Review

Table of whole number pythagorean triples. The largest has 5 digits which requires insight into how to find Pythagorean triples.

Changed how we view the history of Mathematics. We can't know anything more about this tablet for sure, however we can make guesses about it.

Theories

1. It is a trig table for $tan^2(\theta)$ or $\frac{1}{cos^2(\theta)}$ depending on how you intepret the first column
2. Negebaur
   Generate as follows:

   if p and q take on whole number values subject to conditions
   (a) $p > q > 0$
   (b) p and q have no non-trivial common divisor.
   (c) p and q are not both odd.
   then:

   $$x = p^2 - q^2 = s \tag{1}$$
   $$y = 2pq = D \tag{2}$$
   $$z = p^2 + q^2 = l \tag{3}$$

   This will produce all Reduced Pythagorean triples exactly once.
3. The table is a table of reciprocal pairs x, y with $x * y = 1 * 60^n$ for some n.
   The x, y would have been listed in the missing part of the table.

   $$s' = \frac{s}{l} = \frac{x - y}{2} \tag{4}$$
   $$l' = \frac{l}{l} = 1 \tag{5}$$
   $$d' = \frac{d}{l} = \frac{x + y}{2} \tag{6}$$

   Alongside some scaling so that s and d are coprime.

Evidence

All the theories are consistent with the numbers present in the table and are mathematically sound.

- The first interpretation seems natural however when inspecting the angle measurements it seems strange to pick the range
  It also seems strange since we have no other records of Babylonians using trigonometry.
- The p and q values seem to be random
  This is strange since Babylonians don't really need to calculate these values, and we don't have records of them doing abstract values.
- The third theory seems good.
  This seems evidenced, since Babylonians use x and $\frac{1}{x}$ in math problems often.