Razmig Bartassian
02-08-21

INTD 290 Midterm

2 Maps of the New World

1. Virreinato 2 (de Nueva España)
2. Virreinato 2 (de Nueva España)
3. Virreinato 1 (del Perú)
4. The low-latitude aurora of 1789 was observed in modern day Mexico City (Virreinato 2), and it was also observed in European countries, such as France.
5. Some of the locations explored by La Condamine were Quito (Virreinato 3) and Lima (Virreinato 1).
6. Virreinato 3 (del Nueva Granada)
7. José Celestino Mutis took place in Virreinato 3 (del Nueva Granada). The *Colegio del Rosario* is located in the city of Santa Fe de Bogotá.
8. The Pierre Auger Observatory is located in Argentina, which would have been located in Virreinato 4 (del Río De la Plata).

3 Asynchronous Activity Review I

1. The physics detector shown in Fig. 2 is the High-Altitude Water Cherenkov Observatory (HAWC). The purpose of this detector is to record the particles that are created in cosmic ray and gamma ray showers, which would allow scientists to create a galactic map of where these gamma rays are coming from. An array of water tanks fitted with multiple sensors detect the Cherenkov light created by these gamma rays as they travel through the water, which help measure the direction of where the gamma rays came from.
2. The significance of Mexican cities as the one pictured were the trade routes and the mining areas. The mining in these Mexican cities is what helped generate money for the whole region. They were home to numerous different colleges and schools, which were responsible for developing the scientific community and, thus, scientific concepts. The trade routes that these cities offered were also very important for the spread of scientific information throughout the region.
3. The city that is being shown in Fig. 3 is San Luis Potosi, which is located in Mexico and controlled by the Spanish crown at the time. It was a major mining hub for gold and silver, as well as a major trade route during the 16^{th} to 19^{th} centuries.

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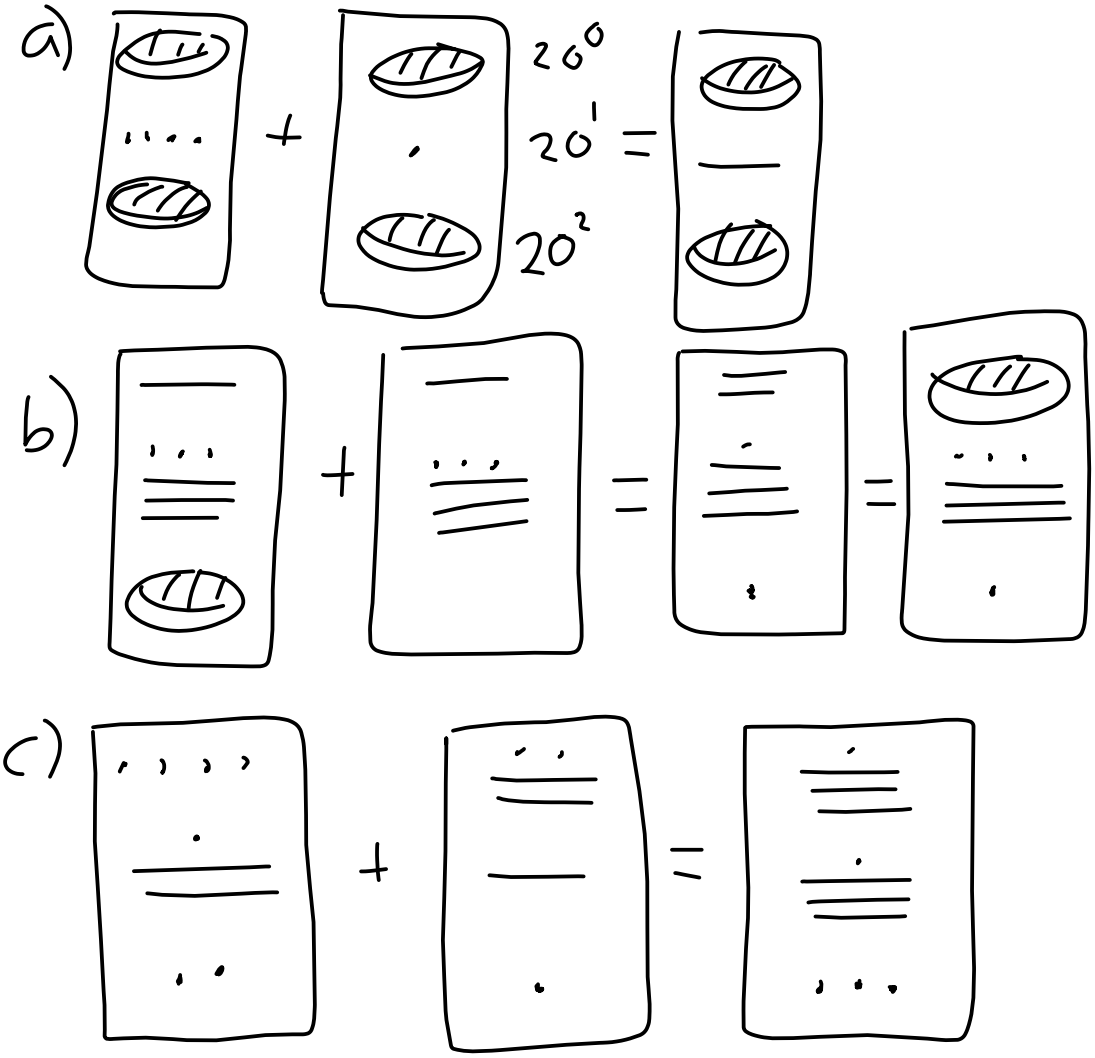
4 Asynchronous Activity Review II

1. Work out the following problems using the Mayan system.



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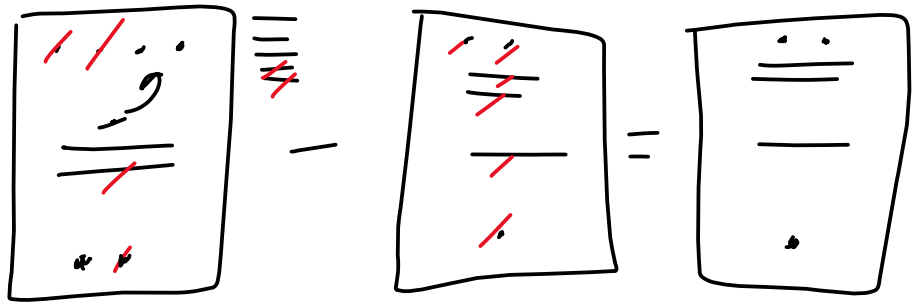
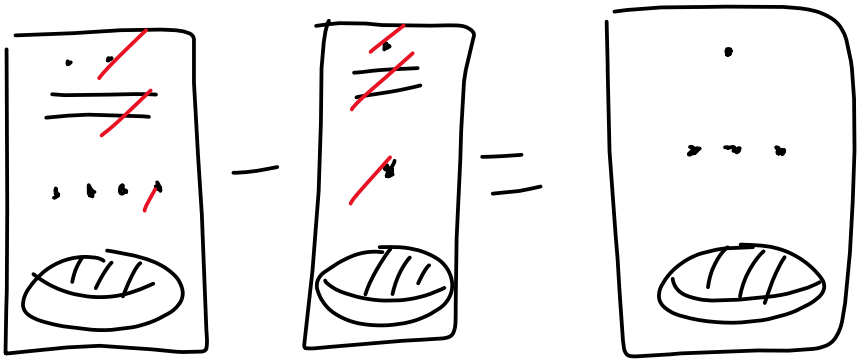
2. Work out the following subtraction problems using the Mayan System.

a)



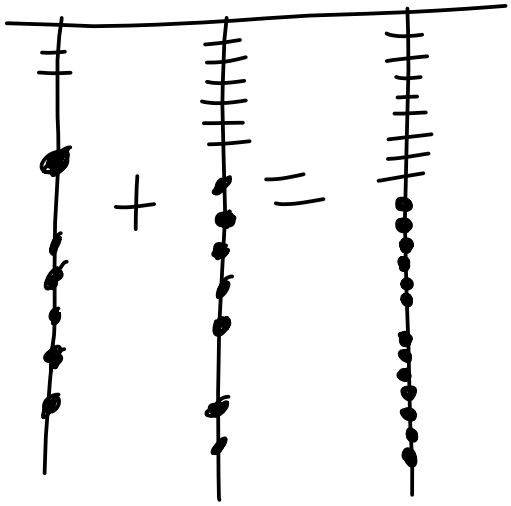
b)



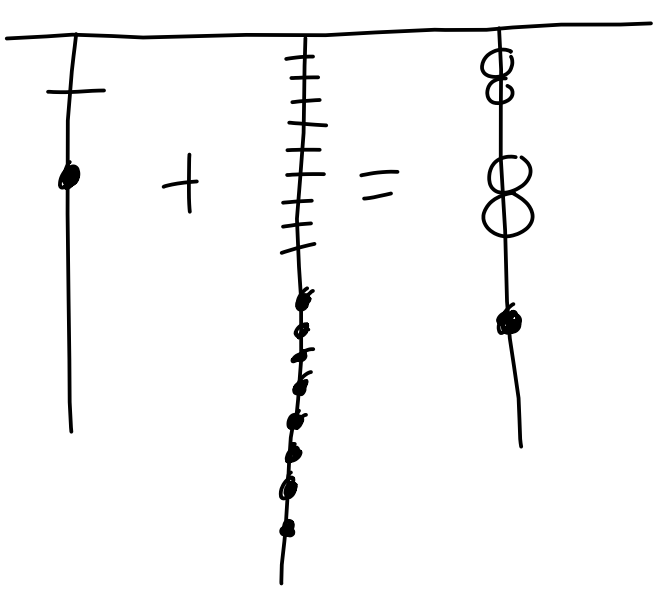
Razmig Bartassian
02-08-21

3. Work out the following addition problems using the Incan quipu.

a)



b)



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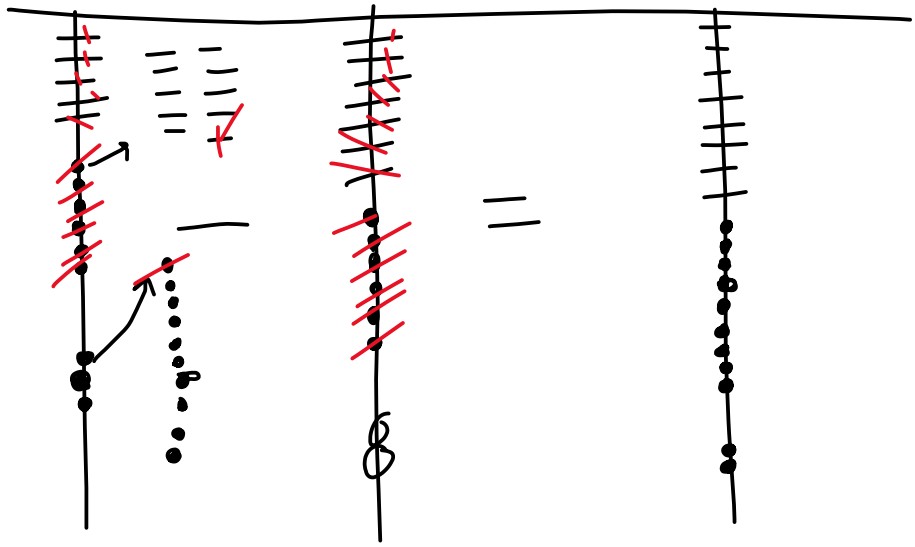
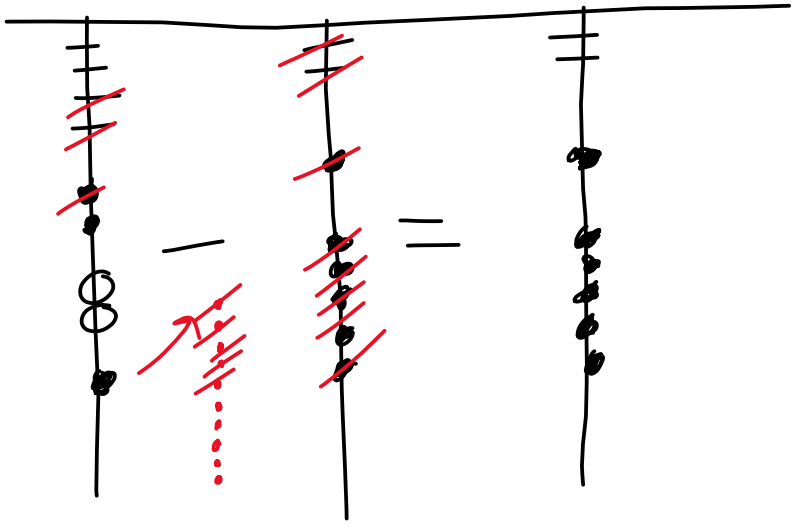
4. Work out the following subtraction problems using the Incan quipu.

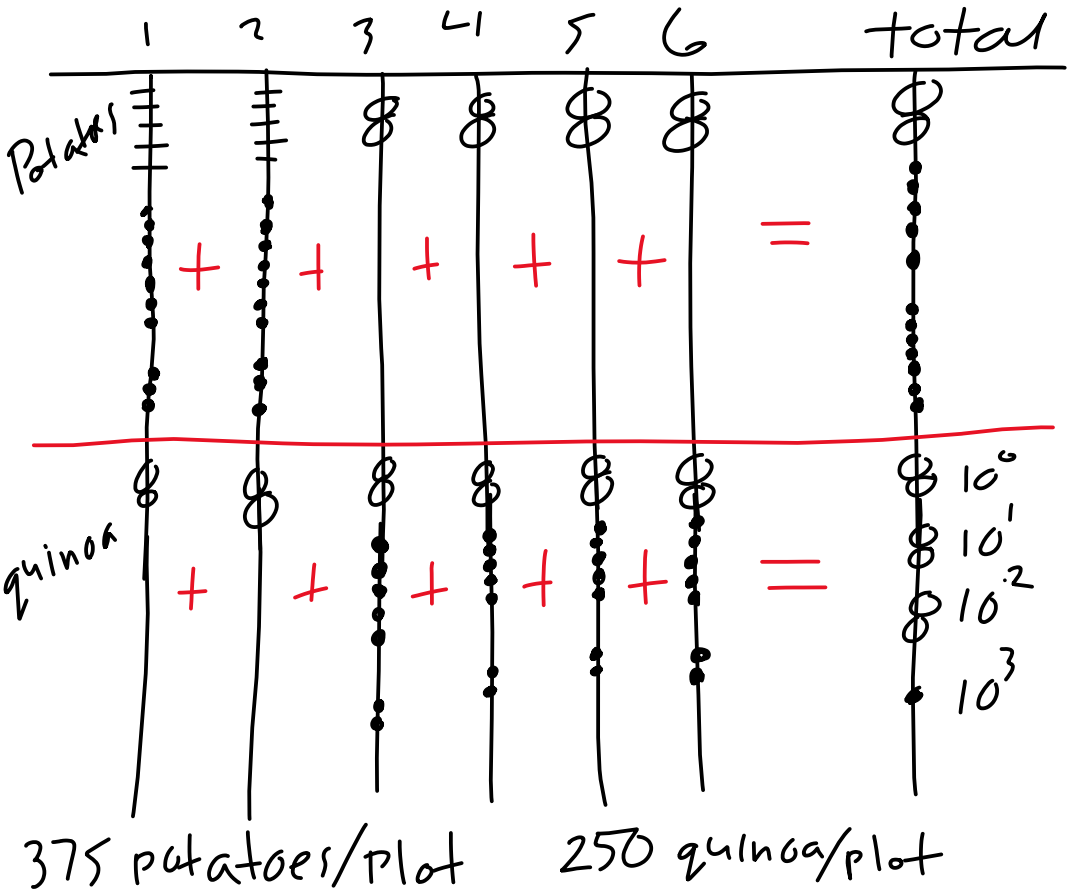
a)



b)



5. Terrace Plots



5 Connection to Physics

1. C: The Pierre Auger Observatory
2. C: To detect cosmic rays that originate outside the solar system
3. A: A photon of light
4. A: A water tank designed to record Cherenkov radiation

6 Vocabulary

1. A: The idea that reason rather than experience is the foundation of certainty in knowledge
2. C: An otter
3. D: A tomato
4. B: A shrub or tree used to create quinine
5. B: Lowering internal body temperature and metabolism to levels that render the individual immobile and in a hibernating state

6. D: Formally known as the Society of Jesus, this is a Catholic order founded by Saint Ignatius of Loyola

7 Free Response Section

1. In Nueva Granada, the Jesuits were in charge of education until they were banished from Spanish territories in 1767. After they were banished, the Dominicans started to monopolize education and encouraged scientific activities and Newtonian theories in their schools of mining and anatomy. In the Universidad of Caracas, Newtonian physics was not allowed to be taught until Professor Baltasar de los Reyes Marrero came into the college in 1788.
2. The aurora borealis in 1789 that was visible from Mexico City was very significant because it prompted scientists from Europe and the New World to investigate and theorize why it was possible to see an aurora so close to the equator. Because this aurora was so close to the equator, Mexican scientists were able to observe and theorize the cause of these auroras. Mexican astronomer León y Gama thought the auroras can only be observed at certain angles, and he even found a reference that suggested auroras were observed by indigenous people in 1602. Jose Francisco Dimas Rangel was a Mexican watchmaker and engineer who presented an experimental design that would replicate an aurora. The experiment was similar to a modern-day fluorescent light.
3. European people would treat dysentery with vinegar, manure with wine, grounded pig feet with wine, or even dog urine with wine. The thought was that acidic things would change the microfauna in the body to treat the disease. The European people would also treat broken ribs by baking ground goat manure with wine and plastering it to the ribs as a way to stimulate the healing process. The Nahua people would treat diarrhea by boiling tzipipatli in water or atole with chia, and they knew that the herbal things the mother would consume would pass on to the baby from breastmilk. The Nahua people would also treat broken bones by cutting the area with an obsidian knife and then applying iztaczazalic and tememetatl to the cut. They would also use ipomoea flowers as an entheogen to relieve the person’s pain.
4. Catholic censorship of knowledge was very common during the scientific revolution to enforce scholastic thought, which are principles and concepts laid out in traditional texts such as the Bible. Scholastic thought would be geocentrism, or the belief that the Earth is

at the center of the universe. The Church wanted to censor empirical thought, or the use of observations from the natural world to support principles and concepts. Empirical thought would be heliocentrism, which was supported by Galileo's discovery of Jupiter's moons (observation). Private libraries were formed to help spread scientific information among other scientists as a way to counter-act the censorship. There was a book trade between France, Spain, and New Spain, which allowed for the spread of European Capitalism and industrial development. Without a book trade, these Enlightenment ideals wouldn't have spread throughout the New World due to the ongoing censorship. Jose Antonio Alzate y Ramirez is an example of a Catholic scholar. He was a Catholic priest that studied meteorology, physics, mathematics, and indigenous history. He predicted that the aurora borealis of 1789 would have been observed in other countries around the world, not just at certain angles. Antonio de Leon y Gama was another Latin American scientist who located references of indigenous people observing auroras in the 1600s.