Thinking in a positional base system homework:

(\_\_/3 pts) 1. You saw in the videos what base-blocks would look like for representing base 5 numbers. Sketch what base-blocks would look like for representing base 6 numbers (show 3 place-values).

(\_\_/8 pts) 2. Tell the numbers (using the given base) that come before or after the given number:

|  |  |  |
| --- | --- | --- |
| **Base 10** | **Base 5** | **Base 6** |
| What number comes after 39? | What number comes after 345? | What number comes after 356? |
| What comes before 30? | What comes before 305? | What comes before 306? |
| What comes before 100? | What comes before 1005? | What comes before 1006? |
| What comes after 249 | What comes after 2445? | What comes after 2456? |
| What comes before 2000? | What comes before 20005? | What comes before 20006? |

Explain how the patterns are similar in the different bases:

(\_\_/6) 3. Sketch the number using base-blocks, and then find the base 10 number that shows the same value (convert to base 10—show your work):

a. 2435

b. 24035

c. 2436

(\_\_/6 pts) 4. What is the base 5 numbers that tells the same value as each of these base 10 numbers (convert to base 5—show your work):

a. 23

b. 59

c. 268

(\_\_/2 pts) 5. I would never write: 525 because that wouldn’t be an allowed base 5 number. Why not?

(\_\_\_/3 pts) 6. Pick one of the historical/non-standard number systems (that is *not* Roman numerals) out of the textbook section, and do the following for it:

a. Write the number 24710 in that number system

b. Explain whether the number system is based on 10 or if it is based on a different number.

c. Explain whether the number system is a place value (positional) number system or not and how you know.

(\_\_/4 pts) 7. Write out the base 5 counting sequence from 15 to 1005. (hint: you’ll be writing 25 numbers)