

Math 123  
 Spring 2023  
 Dr. Lily Yen

# Quiz 2

Show all your work

Name: \_\_\_\_\_  
 Number: \_\_\_\_\_  
 Signature: \_\_\_\_\_  
 Score: \_\_\_\_/14

**Problem 1:** Write 543 as a Kaktovik numeral.

0	1	2	3	4	5	6	7	8	9
∞	∖	∨	∩	∩	∩	∩	∩	∩	∩
10	11	12	13	14	15	16	17	18	19
>	∩	∩	∩	∩	∩	∩	∩	∩	∩

List the place values in base-20 to see that  $543 = 1 \times 400 + 7 \times 20 + 3$ .

∖ ∩ ∩

Score: /2

**Problem 2:** Express the Hindu-Arabic numeral 447 in Mayan numeral.

0	1	2	3	4	5	6	7	8	9
	•	• •	• • •	• • • •	_____	•	• •	• • •	• • • •
10	11	12	13	14	15	16	17	18	19
=====	•	• •	• • •	• • • •	=====	•	• •	• • •	• • • •

$447 = 1 \times (18 \times 20) + 4 \times 20 + 7$ ,

Score: /2

**Problem 3:** Write the Egyptian numeral using a Hindu-Arabic numeral.

1 211 231

1	10	100	1000	10 000	100 000	1 000 000
	∩	∩	∩	∩	∩	∩

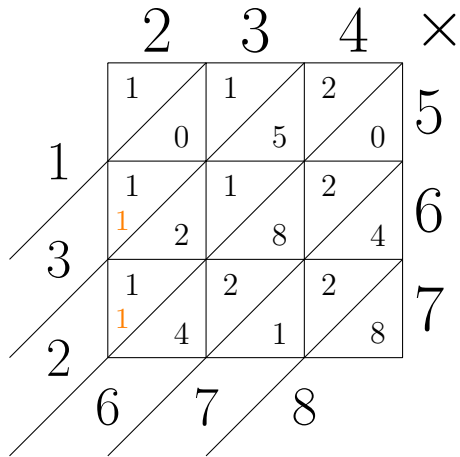
Using the table, we translate

$1 \times 1\,000\,000 + 2 \times 100\,000 + 1 \times 10\,000 + 1 \times 1\,000 + 2 \times 100 + 3 \times 10 + 1 = 1211231$

Score: /2

**Problem 4:** Multiply  $234 \times 567$  using the galley method.

132 678



Score: /2

**Problem 5:** Compute  $2023021_4 - 230113_4$  using the two-line algorithm.

1132302<sub>4</sub>

Line up vertically

$$\begin{array}{r} 2023021_4 \\ - 230113_4 \\ \hline 1132302_4 \end{array}$$

Score: /3

**Problem 6:** Fire Horse has a bag of chickpeas. When she lines them up 5 in a row or 7 in a row, she has 3 left over in each case. If she lines them up 9 in a row, she has 1 left over.

Find the smallest number of chickpeas that Fire Horse may have.

73

If we put 3 chickpeas aside, the remainder is a multiple of both 5 and 7, so a multiple of  $\text{lcm}(5, 7) = 35$ . Therefore the total number of chickpeas is one of 3, 38, 73, 108, 143, 178, 213, 248, ...

The number of chickpeas is also 1 more than a multiple of 9, so 1, 10, 19, 28, 37, 46, 55, 64, 73, 82, ...

The first number common between the two lists is 73 and the next is  $73 + \text{lcm}(5, 7, 9) = 73 + 315 = 388$ .

Score: /3