Math 123-02
Summer 2024
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Assignment 2

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ___/14

Problem 1: Write 8967 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 $8977 = 1 \times 8000 + 2 \times 400 + 8 \times 20 + 7$.

Score: /2

Problem 2: Express the Hindu-Arabic numeral 578 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: Translate the following Babylonian numeral to Hindu-Arabic numeral.

$35 \times 60^2 + 12 \times 60 + 47 = 126\,767$

Score: /2

Problem 4: Translate MCMLXIV to Hindu-Arabic numeral.

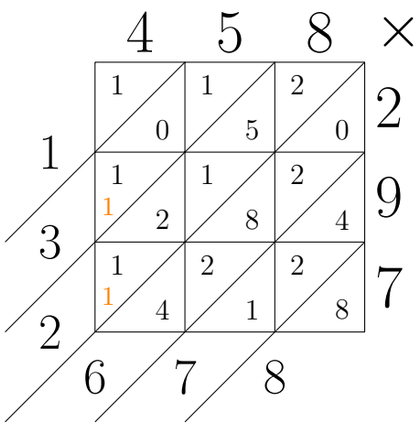
$1000 + (1000 - 100) + 50 + 10 + (5 - 1) = 1964$

Score: /2

/8

Problem 5: Multiply 458×297 using the galley method.

$\boxed{132\,678}$



Score: /2

Problem 6: Compute $2064371_8 - 360517_8$ using the two-line algorithm.

$\boxed{1132403_5}$

Line up vertically

$$\begin{array}{rr} & 2023321_5 \\ - & 340413_5 \\ \hline & 1132403_5 \end{array}$$

Score: /2

Problem 7: In the Dungeon Theatre of the Dragons, the seats are arranged 7 in a row to the left of the stage and 9 in a row to the right of the stage. Suppose the extended family of Fire Horse gathers to see a show in the Dungeon Theatre; if they all sit on the left of the stage, there are 3 members of the family without a seat. If they all sit on the right of the stage, there are 4 empty seats. Find the smallest possible number of seats the Dungeon Theatre may have.

Say there are L rows on the left and R rows on the right. Then there are $7L$ seats on the left and $9R$ seats on the right. Therefore $7L + 3 = 9R - 4$, so $7L + 7 = 9R$, so $7(L + 1) = 9R$. Thus R is divisible by 7, so the smallest possible (positive) value for R is 7. If $R = 7$, then $7(L + 1) = 9 \times 7$, so $L + 1 = 9$, so $L = 8$.
In total, $7L + 9R = 7 \times 8 + 9 \times 7 = 119$ seats.

Score: /2