

Math 123-02  
Spring 2026  
Dr. Lily Yen

Quiz Two  
Show all your work

Name: \_\_\_\_\_

Number: \_\_\_\_\_

Signature: \_\_\_\_\_

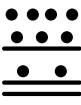
Score: \_\_\_\_/10

**Problem 1:** Convert  $65_{10}$  into base-2.

$65 = 64 + 1 = 2^6 + 2^0 = 1000001_2$


Score: \_\_\_\_/1

**Problem 2:** The following Mayan numeral has three places. Express it as a Hindu-Arabic numeral.

  $= 4 \times (18 \times 20) + 8 \times 20 + 12 = 1612$


Score: \_\_\_\_/2

**Problem 3:** The following Kaktovik numeral has 4 places. Find its Hindu-Arabic numeral.

  $= 17 \times 20^3 + 9 \times 20^2 + 12 \times 20 + 2 = 139\,842$

Score: \_\_\_\_/2

**Problem 4:** Convert  $14\,768_{10}$  to a Babylonian numeral.

$14\,768 = 4 \times 60^2 + 6 \times 60 + 8 =$  

Score: \_\_\_\_/2

**Problem 5:** Fire Horse likes to play with her model dragons. When she lines them up 7 in a row, she has 4 left over. When she lines them up 6 in a row, she finds her last row short of 1 dragon to complete a row. Suppose her collection of dragons contains at least 50, find the smallest possible number of dragons in her collection.

Say she has  $n$  rows of seven. Then the total number of dragons is  $7n + 4$ . Similarly, if she has  $m$  rows of six, the total is  $6m - 1$ . Therefore  $7n + 4 = 6m - 1$ , so  $7n + 5 = 6m$ . The solutions to this equation are

$n$	1	7	13	19	...
$m$	2	9	16	23	...
Total	11	53	95	137	...

This is another way of finding an answer compared to the solution to the last question of In-class assignment 2.

Score: \_\_\_\_/3