

Quiz 1

Show all your work

Name: _____
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 Score: ____/21

Problem 1: Translate the Roman numeral MCMLXIV into the equivalent Hindu-Arabic numeral.

1964

M is 1000, CM is 1000 - 100, LX is 50 + 10, and IV means 5 - 1.

Score: ____/3

Problem 2: For New York's Super Bowl 46, a big sign in Roman numeral was built. What was the Roman numeral for 46?

XLVI

XL is 50 - 10, and VI means 5 + 1.

Score: ____/2

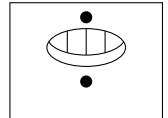
Problem 3: Write 12321 as a Babylonian numeral.

The Babylonian number 12321 is greater than 3600, so we divide by 3600 first.
 $12321 = 3 \times 3600 + 1521$
 Then we take $1521 = 25 \times 60 + 21$ to get the following.



Score: ____/3

Problem 4: Translate the addition problem in the Hindu-Arabic numeral $247 + 154$ to an addition problem in Mayan numeral, and find the answer in Mayan numeral.



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


$247 = 12 \times 20 + 7$ and $154 = 7 \times 20 + 14$, so in Mayan numerals,

$$\begin{array}{c} \text{••} \\ \text{=====} \\ \text{•} \end{array} + \begin{array}{c} \text{••••} \\ \text{=====} \\ \text{••} \end{array} = \begin{array}{c} \text{••••} \\ \text{=====} \\ \text{••••} \\ \text{=====} \\ \text{••} \end{array} = \begin{array}{c} \text{••••} \\ \text{=====} \\ \text{•} \\ \text{=====} \\ \text{••} \end{array} = \begin{array}{c} \text{••••} \\ \text{=====} \\ \text{•} \end{array} = \begin{array}{c} \text{=====} \\ \text{=====} \\ \text{•} \end{array} = \begin{array}{c} \text{•} \\ \text{=====} \\ \text{•} \end{array}$$

Score: ____/4

Problem 5: Write the Egyptian numeral  using a Hindu-Arabic numeral.

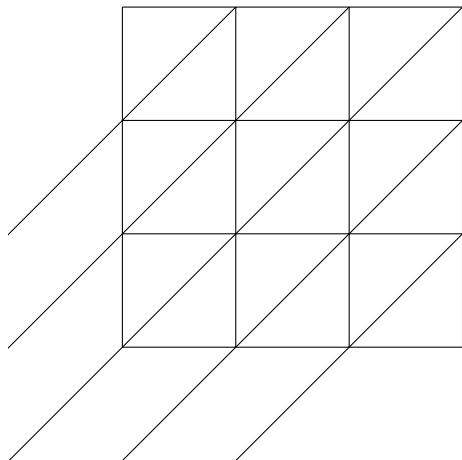
1 103 221

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

Using the table, we translate $1\,000\,000 + 100\,000 + 3 \times 1000 + 2 \times 100 + 2 \times 10 + 1 = 1103221$

Score: /2

Problem 6: Multiply 468×357 using the galley method.



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Score: /2

Problem 7: Subtract $1001001_2 - 110110_2$ in base 2, then check your answer by converting the entire subtraction problem including its answer to base 10.

10011₂

Check (in base 10 except as indicated):

$$1001001_2 - 110110_2 = (2^6 + 2^3 + 2^0) - (2^5 + 2^4 + 2^2 + 2^1) = 73 - 54 = 19.$$

Score: /3

Problem 8: The Vikings Marching Band is considering different configurations for its upcoming half-time show. When the members are arranged eight in a row or ten in a row, there are two members left over in each case. If they are arranged twelve in a row, there are six left over. Find the smallest number of members that the band can have.

The least common multiple of 8 and 10 is 40, so the number of members of the band is 2 more than some multiple of 40: 2, 42, 82, 122, 162, ...

The number of members is also 6 more than some multiple of 12: 6, 18, 30, 42, 54, 66, ...

The first number common between the two lists is 42 and the next is 162.

Score: /2