Full name: _____

Teacher: _____

Due date: _____

YEAR 7 MATHEMATICS

Assignment 1

2020

Driving Question	
Is there a better number system than our current one? This assessment task is comprised of three parts. By answering each part of this assessment, you will gain a better understanding of the development of number systems in the past and be able to answer the driving question.	
Content Assessed	
Refer to the attached assignment booklet and instructions. You will need to answer in the blank spaces provided.	
Weighting	**Due Date**
15%	Week 7 - The task is due exactly two weeks after the task is received.

Mathematics Outcomes Assessed

- **MA4-1WM:** communicates and connects mathematical ideas using appropriate terminology, diagrams and symbols.
- **MA4-2WM:** applies appropriate mathematical techniques to solve problems.
- **MA4-3WM:** recognises and explains mathematical relationships using reasoning.
- **MA4-4NA:** compares, orders and calculates with integers, applying a range of strategies to aid computation.

Links to History Outcomes

- **HT4-3** describes and assesses the motives and actions of past individuals and groups in the context of past societies
- **HT4-4** describes and explains the causes and effects of events and developments of past societies over time

Marks

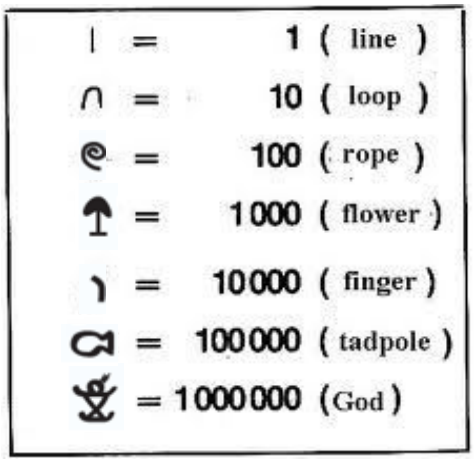
Part 1: Exploring a Number System	**/8**
Part 2: Researching a Number System	**/15**
Part 3: Creating a Number System	**/15**
Total	**/38**

PART 1: Exploring a Number System (8 marks)

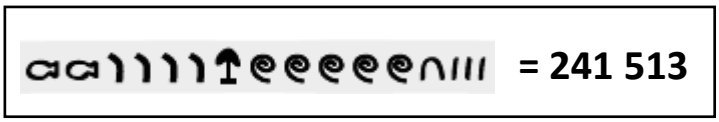
All ancient civilizations developed methods to count and use numbers. The methods they used to represent numbers did not involve the ten digits 1, 2, 3, 4, 5, 6, 7, 8, 9 and 0 that we use today, but included different systems such as letters, other symbols, pebbles, tying knots in ropes or cutting notches in sticks. As the need to use and represent larger numbers became more and more important, many old systems disappeared.

The Egyptian Number System

The ancient Egyptians are one of the oldest known civilizations to have a recorded number system. About 5000 years ago, the Egyptians used hieroglyphics. The hieroglyphs used for numbers are shown below.



Example: The example below shows how the symbols are used to represent numbers. As the numbers get larger in value, the symbols are simply repeated. This set of symbols represents **241 513**.



Using the key above, answer the following questions.

1. What number is represented by the Egyptian symbols pictured below?

1 mark

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2. Show how the ancient Egyptians would have represented the number 2147.

1 mark

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3. It was estimated that the population of the ancient Egyptians was between 2 and 4 million people. Using symbols, construct a number between 2 and 4 million in ancient Egyptian.

1 mark

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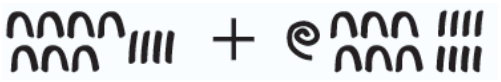
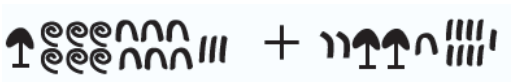
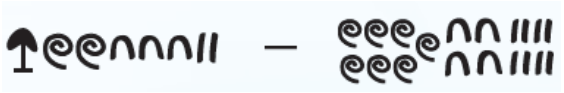
4. The ancient Egyptian system was not limited to representing numbers. Addition and subtraction could easily be performed when it was required. Perform the following additions and subtractions, giving your answers as Egyptian numbers/symbols.

a.  1 mark

b.  1 mark

c.  1 mark

5. What is the solution to 240 x 3? Write your answer using the Egyptian symbols. 1 mark

6. The ancient Egyptians were renowned for their contributions in Science and Mathematics. State **one** way in which you could improve the ancient Egyptians number system. 1 mark

PART 2: Researching a Number System (15 marks)

During this section, you are required to research either the **Babylonian Number System** or the **Roman Numeral Number System** to answer the following questions.

1. Please **circle** your chosen number system:

Babylonian **Roman Numeral**

2. Write a brief summary about your chosen number system. This summary should include:
   - an approximate **year** that the number system was first used
   - **three** key characteristics of the number system
   - **one** way in which the chosen system differs from our base-10 (hindu 5rabic) number system.

5 marks

3. How is the number zero represented in your chosen number system?

1 mark

4. Show the number **756** in your chosen number system.

1 mark

5. Solve the following problems. Write your answer using the symbols of the chosen number system.

   a. **574 + 320**

1 mark

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   b. **400 – 57**

1 mark

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6. Fill in the blanks of this multiplication chart using your chosen number system.

X	**2**	**5**	**8**	**10**
3			24	30
4		20		40
5	10		40	
6	12			60

4 marks

7. Solve the following problem, writing your answer in your chosen number system.

   Two numbers add to give 15 and the same two numbers multiply to give 56. What are the two numbers?

2 marks

PART 3: Creating a Number System (15 marks)

The world has adopted what we call the decimal counting system (using hindu-arabic symbols). It is thought that we first adopted this system because we could count up to ten "digits" (fingers) on our hands. This is considered a "base-10" system. As the numbers got larger we continued to develop this number system through time. However, what would our number system look like if we had 14 fingers, or 20? Is our number system the best it could be?

In this section, you are to create your own number system that has its own base. You will need to develop new symbols to represent our numbers; just as the Egyptians, Babylonians and Roman's did. For ideas, it may be worth watching the videos below:

https://www.youtube.com/watch?v=U6xJfP7-HCc
https://www.youtube.com/watch?v=EyS6FfczH0Q

(Note: you cannot use these symbols/ideas).

Rules:

- You cannot use the symbols 0 – 9.
- Your system cannot be base 10 (when it gets to 9 you can't move into the "tens" column).
- Your number system must use place value.

Name of my number system: _____

1. In the space below, draw your symbols and write the values that they represent in our current number system. 3 marks

2. Provide an explanation of your new number system. In your explanation make sure to include: 9 marks

- the key characteristics of the number system
- why you used those symbols (what do they represent?)
- whether your system has a value for zero
- whether the order for your symbols matters
- how the chosen system is similar to, or differs from, our base-10 number system.
- the advantages or disadvantages of this system versus other number systems (Egyptian, Babylonian, Roman Numbers, Hindu-Arabic)

Refer to the rubric attached at the back of this booklet to ensure you are meeting all criteria.

3. Using the symbols of your number system, construct 3 examples of numbers greater than 10 000.

3 marks

End of Assessment

Marking Criteria – Part 3 Question 2

3 marks	2 marks	1 mark	0 marks
The key characteristics and reasons for the symbols were thoroughly explained. Symbols are easy to identify, easy to draw and could be used suitably to make mathematical calculations in our everyday world.	A brief explanation of the symbols has been provided. The reasoning behind the use of particular symbols is adequate and most of the characteristics are explained.	Symbols are disjointed and there is minimal relationship between them. Some characteristics are explained.	There is no reasoning for the symbols chosen. The characteristics of this number system were not explained.
The number system is different to our base-10 system. An outline between the similarities and differences of the student's number system and our current number system demonstrates evidence of a deep understanding of the properties of our number system.	The created number system is different to our base-10 system, but with some mistakes. They have made comparisons between the two number systems that exhibit sound levels of knowledge of our number system.	The number system uses different symbols, but still operates in a base-10 number system. Basic comparisons have been made to our current number system.	The number system is no different to the current one.
A thorough analysis of the advantages and disadvantages of the created number system versus other number systems is present.	Some of the advantages and disadvantages of the created number system versus other number systems is discussed.	One advantage or disadvantage is highlighted between the number systems of the past and the created number system.	No outline of the benefits and/or disadvantages of the created number system.