Student Name: **Proctor Name**

start time end time

	Problem	Total Points	Score
Part I		25	
Part II			
	1	8	
	2	8	
	3	11	
	4	8	
	5	10	
	6	30	
Total	100		

Guidelines

- You have 1 hour to take the exam.
- The exam will be given in two parts.
- Part I is written without any aids: no notes, no book, no phone. You should spend no more than 15 minutes on Part I.
- Turn your completed Part I to the proctor and you will be given Part II. You cannot return to Part I once you have turned it in.
- For Part II, you may use a calculator and two pages of notes (i.e. two sheets of paper).

Part I

This part is written without notes or aids of any kind. It is worth 25 points out of 100 total points.

Below is a list of eight mathematicians or mathematical documents. Give a detailed description of **five of the eight**. A complete description will include approximate dates, location, and mathematical significance.

Once you have completed Part I and turn it in, you will be given Part II. You cannot return to Part I once it has been turned in.

1. Rhind Papyrus

2. Moscow Papyrus

3. Plimpton 322

4. Thales of Miletus

5. Pythagoras of Samos

6. Euclid

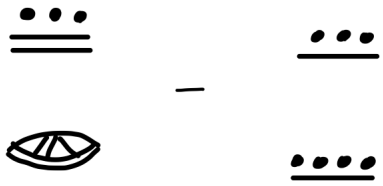
7. Theon of Smyrna

8. Eudoxus of Cnidos

Part II

For this part, you may use a calculator and up to two pages of notes. This part is worth 75 points out of 100 total points.

1. (8 points) Demonstrate *using Mayan symbols* how ancient Mayans must have performed subtraction below.



2. (8 points) Use the ancient Egyptian method to divide 47 by 18.

3. (11 points)

   (a) Write the base 60 number $(3, 45)$ in base 10.

   (b) Explain how $(3, 45)$ could be viewed by ancient Babylonians as the reciprocal of 16. Your answer should include a computation.

4. (8 points) Give a proof-by-picture proof that the sum of two consecutive triangular numbers is a square number.

5. (10 points) Solve the problem below using the method of false position.

   A quantity, its half, and its fifth added together becomes two. What is the quantity?

6. (30 points) Short Answer

   (a) Give an example of a numerical system of representation that is *additive* and another example that is *positional* and explain the difference.

   (b) Greek mathematicians starting using an *alphabetic* or *ciphered* numeral system by the 5th century b.c. Explain what an alphabetic numeral system is, its advantages and disadvantages.

(c) Describe two impressive accomplishments of ancient Egyptian mathematicians.

(d) Compare the Babylonian approach to quadratic equations with the modern approach.

(e) Explain what **ancient Greeks mathematicians** meant by the statement "the diagonal of a square and its side are incommensurable."