

Your Name: _____

Directions

Do all work on the sheets provided (if you use the back of a sheet, please place a note telling me to look there). There is an extra sheet of scratch paper at the end. You may detach that if you like, but please hand it in with your exam.

Please do not write below.

Problem	Points/Poss
I	/ 15
II	/ 30
III	/ 20
IV	/ 10
V (Essay)	/ 25
Total	/100

I. Short answer. Answer any 6 of the following.

A) (2.5) What base 10 number is represented by these Egyptian hieroglyphs?

Answer: _____

B) (2.5) What base 10 number is represented in the Babylonian way by these symbols?

Answer: _____

C) (2.5) Approximately *when* was the Middle Kingdom period in Egyptian history?

Answer: _____

D) (2.5) The name for the writing system used in question B is

Answer: _____

E) (2.5) What are the two most important surviving records of ancient Egyptian mathematics?

Answer: _____

F) (2.5) Most of the geographical area of the Old Babylonian kingdoms is contained in what present-day country?

Answer: _____

G) (2.5) Approximately when did Thales live and what part of the Greek world did he come from?

Answer: _____

H) (2.5) Who founded the Academy in Athens whose entryway was inscribed “let no one unversed in geometry enter here?”

Answer: _____

II. Compute “in the Egyptian way”

A) (15) 37×136

1. B) (15) $52 \div 18$ (“compute with 18 until you find 52”)

III. (20) An Old Babylonian problem text asks for the side of a square if the area of the square minus the side is the base 60 number 14,30;0. The tablet says to do this to solve the problem (all numbers in base 60, of course!): “Take half of 1, which is 0;30, square that to get 0;15, add the 14,30 to get 14,30;15. The last number is the square of 29;30. Now add the 0;30 to get 30, which is the side of the square.”

In modern language, the problem is to solve for x if $x^2 - x - 870 = 0$. Find x by solving this equation, then explain how the Babylonian method of solution is essentially the same as using the quadratic formula for the equation $x^2 - x - 870 = 0$.

IV. (10) What is Proposition 1 in Euclid's *Elements*? Describe the associated construction.

IV. Essay. (25) “The distinguishing feature of Babylonian mathematics is its algebraic character.” Of the historians we have mentioned, who would agree with this claim, and who would disagree? Explain using the the interpretations your historians would give for the YBC 6967 problem of solving the equation $x = 60/x + 7$.