Mathematics 3010 Spring 2012 **Midterm** **Name: _____**

1. (4 pts) Name two ancient civilizations that approximated pi by three.

2. (3 pts) Write 243 in Egyptian hieroglyphic notation.

3. (3 pts) Write 962 in Babylonian cuneiform notation.

4. (5 pts) Show how to compute 13 x 45 using Egyptian methods.

5. (5 pts) Write 3/5 as a sum of unit fractions, not repeating any unit fraction.

6. (6 pts) Divide 92 by 5 using Egyptian methods.

7. (5 pts) Describe the Egyptian estimation of pi.

8. (6 pts) Name three Greek geometers that predate Euclid.

9. (4 pts) Put in order: Aristotle, Archimedes, Euclid, Pythagoras, Ptolemy.

10. (2 pts) Name a famous student of Aristotle.

11. (4 pts) Describe Russell's paradoxical set.

12. (4 pts) Describe the Banach-Tarski paradox.

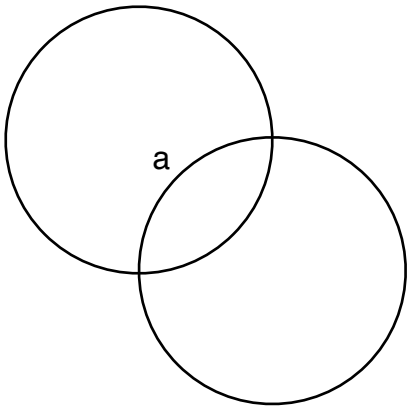
13. (6 pts) State the continuum hypothesis and describe its status in mathematics.

14. (6 pts) State Fermat's last theorem. Who proved it, and approximately when?

15. (6 pts) Give three names associated with non-Euclidean geometry or attempts at proving the fifth postulate.

16. (8 pts) Give an ancient proof of the Pythagorean theorem.

17. (8 pts) The Babylonian “barge” is the area between two quarter circles, as shown. Using 3 for pi, find the area of the barge in terms of the length a of the arc of one of the quarter circles.



18. (15 pts) Write an essay going into some detail on one topic discussed in class. Example topics: infinite sets, incompleteness theorems, non-Euclidean geometry, Euclid's Elements. Or choose a topic from those covered in class. Make sure to give some names and approximate dates.