

SAMPLE QUESTIONS FOR EXAM

MATH 111, HISTORY OF MATH, DUCHIN

READINGS

- (1) Describe Aristotle's reactions to some of Zeno's notable paradoxes in a few sentences.
- (2) Explain "the method of proofs and refutations" in a few sentences.
- (3) *Each of the following statements is false. Correct it in a few sentences.*
 - Georg Cantor was indifferent to the ontological status of his infinite cardinals.
 - Leonhard Euler condemned the use of infinitesimals.
 - Emmy Noether was one of the founding members of Bourbaki in 1904.
 - Ramanujan learned all of his mathematics, including his style of presentation, from one book: Euclid's *Elements*. This gave him a strong rigorous and deductive orientation.

PROBLEMS

- (1) Use Egyptian algorithms to do the following: 14×15 , $121/11$, $4/5$.
- (2) Give the continued fraction expansion for $77/21$ and draw the associated anthypharesis picture.
- (3) Triangulate the torus (break it down into triangular faces) and compute $V - E + F$. Explain why you do not get 2.
- (4) Let $M_n(\mathbb{Z})$ be the set of $n \times n$ integer matrices. Do they form a ring?
- (5) Write down the power series for arctan obtained by term-by-term integration of a geometric series. Use this to get an infinite formula for π .