

Mathematics 3810H – Ancient and classical mathematics

TRENT UNIVERSITY, Winter 2016

Assignment #5

Filling the universe

Due on Thursday, 24 March, 2016.

Read T.L. Heath's translation* of Archimedes' *The Sand-Reckoner* and then answer the following questions:

1. Compare and contrast the usual Greek number system with those used in ancient Mesopotamia and Egypt. What are the advantages and disadvantages of each? [4]
2. Summarize the state of astronomical knowledge in Archimedes' time, as revealed in *The Sand-Reckoner*. How are the facts and figures about the solar system given by Archimedes different from our present understanding of them? [4]
3. How many of Archimedes' standard grains of sand would it take to fill up, respectively, the solar system as we understand it today, and the observable universe? [2]

* Taken from *The Works of Archimedes*, edited by T.L. Heath, Cambridge University Press, 1897, pp. 221–232. Reprinted by Dover Books, New York, 2002, ISBN 0-486-42084-1.