

Mathematics 3830H – A Survey of the History of Mathematics

TRENT UNIVERSITY, Winter 2025

Assignment #3

Sand and Star

*Due on Friday, 14 February.**

Please read through the translation of Archimedes' *The Sand Reckoner* on pp. 2-9 of Ilan Vardi's *Archimedes, the Sand Reckoner*, a copy of which can be found on Blackboard, and answer the following questions. The rest of Vardi's article may be helpful in answering questions **1** and **2** below.

1. Based on Archimedes' discussion just what did the Greeks of his time know about the solar system and how accurate was it? [4]
2. What exactly does Archimedes accomplish in this work, allowing for the state of astronomical knowledge at the time? [2]
3. How many grains of sand (of the size used by Archimedes) would it really take to fill the solar system, based on our modern knowledge of it? [4]

NOTE: The answer to the last question is a bit arbitrary, in that it depends on what you consider the bounds of the solar system to be, for which there are several reasonable candidates.

The Corporal Who Killed Archimedes

With one bold stroke
he killed the circle, tangent
and point of intersection in infinity.

On penalty
of quartering
he banned numbers
from three up.

Now in Syracuse
he heads a school of philosophers,
Squats on his halberd
for another thousand years
and writes:

one, two
one, two
one, two
one, two.

Miroslav Holub (1923-1998)

* Please submit your solutions, preferably as a single pdf, via Blackboard's Assignments module. If that fails, please submit them to the instructor on paper or via email to sbilaniuk@trentu.ca as soon as you can.