Mathematics 3810H – Ancient and classical mathematics
Trent University, Fall 2013

Assignment #6
Snowball sentences
(Because winter is coming! :-)
Due on Wednesday, 4 December, 2013.

A snowball sentence is a sentence starting with a word of length one in which each word is one letter longer than the previous one. (Punctuation and diacritical marks don't count.) For example, "I am too late," is a four-word snowball sentence. A reverse snowball sentence is one in which each word is one letter shorter than the previous one, ending with a word of length one. A back-and-forth snowball sentence is one which a word of length one in which each word is one letter longer than the previous one up to some point, and then each word is one letter shorter than the previous one, ending with a word of length one again.

1. Write as long a snowball (or reverse snowball, or back-and-forth snowball) sentence as you can touching on the history of mathematics in ancient or classical times. *[7]*

2. Explain why the number of letters (not counting spaces, punctuation marks, *etc.*) used in any snowball sentence is a triangular number. *[1]*

3. What is the minimum number of triangular numbers that are needed to sum to the number of letters in a back-and-forth snowball sentence? *[1]*

   NOTE: Obviously, in light of **2**, the maximum number of triangular numbers that are needed to sum to the number of letters in a back-and-forth snowball sentence is two.

4. What is the maximum number of triangular numbers that are needed to sum to the number of letters in an arbitrary sentence? *[1]*

Euclid

Old Euclid drew a circle
On a sand-beach long ago.
He bounded and enclosed it
With angles thus and so.
His solemn set of graybeards
Nodded and argued much
Of arcs and of circumference
Diameters and such.
A silent childstood by them
From morning until noon
Because they drew such charming
Round pictures of the moon.

From *The Congo and Other Poems* by Vachel Lindsay.

[I wonder if the author was aware of Hippocrates' quadrature of certain lunes ...]