Mathematics 3810H – Ancient and Classical Mathematics
Trent University, Winter 2016
Assignment #1
The (Lego) Pyramid of Khufu
Due on Thursday, 21 January, 2016.

The Pyramid of Khufu (*a.k.a.* the Pyramid of Cheops or the Great Pyramid of Giza) is the largest and most famous of the pyramids built in ancient Egypt. It was bulit for the pharaoh Khufu of the Fourth Dynasty and is believed to have been completed *c.* 2560 B.C. When built it was 280 cubits (146.5 metres) tall and had a square base 440 cubits (230.4 metres) on a side. Made mostly of limestone and faced with granite, the pyramid is estimated to mass about 5.9 million tonnes.

1. Give a minimum estimate of how much it cost to build the Pyramid of Khufu, in terms of the amount of grain needed to feed the workers building it, not counting the cost of quarrying and moving the stone to the site. *[5]*

2. Give a minimum estimate of how much it would cost to build the Pyramid of Khufu out of 2×2 Lego blocks, in terms of the amount of grain needed to feed the workers building it, not counting the cost of buying and delivering the Lego blocks to the site. *[5]*

NOTE. You will need to look up some facts, or find them out for yourselves, to answer either question. As an insanity check, we will assume, because we're mathematicians and not engineers, that the Lego blocks used in the second question are infinitely strong.