

Mathematics 436 – Spring 2006

Assignment 5

1. Use the Euclidean algorithm to find the greatest common divisor of 963 and 657
2. Suppose that a line of length 1 is divided in extreme and mean ratios, that is the line is divided at  $x$  so that  $1/x = x/(1 - x)$ . Show by the method of the Euclidean algorithm that 1 and  $x$  are incommensurable. In fact, show that the proportion  $1 : x$  can be expressed using Theaetetus's definition as  $(1, 1, 1, \dots)$ .
3. Give a modern proof of the result that there are infinitely many prime numbers. Compare your proof to Euclid's and comment on the difference.
4. Given that a regular pentagon and an equilateral triangle can be inscribed in a circle, describe how to inscribe a regular 15-gon in a circle.