

Problem Set 3

Basic Arithmetics

Problem I

1. Use the Euclid Algorithm¹ to compute the Greater Common Divisor of 2008 and 1757.
2. Decompose 2008 and 1757 as a product of prime numbers. Deduce the Greater Common Divisor and compare the result to the previous question.
3. Computer the Least Common Multiple of 2008 and 1757.

Problem II

Find two integers x and y such that

$$17x + 19y = 1$$

Are x and y unique?

Problem III

Can you find two integers x and y such that $6x + 8y = 1$?

Problem IV

Find the inverse of 9 modulo 25.

Problem V

Write a program to compute the modular inverse of a nonzero integer y . The user should be asked for the number y and the modulus n .

¹Euclid of Alexandria, Greek mathematician from the third century BC, is considered as the father of geometry. In his *elements*, the principles are deduced from a small set of axioms. Euclid was also involved with perspective, conic sections and spherical geometry.



Euclid of Alexandria (~ 365-300 BC)