An Introduction to the Theory of Numbers

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The purpose of these notes is to document my survey of Hardy and Wright's 'An Introduction to the Theory of Numbers'. It is my hope that it will be useful as a reference for others also.

1 Notation and introductory concepts

1.1 $a|b$

We will denote by $a|b$, where a and b are understood to be positive integers, that a divides b. That is, there exists some integer m such that $am = b$.

1.2 Big O

Suppose ϕ is some real valued function on a particular domain. Then by $O(\phi)$ we denote the class of complex valued functions f such that there exists a constant A with

$$|f| < A\phi$$

over the entirety of the domain.

1.3 Little o, $\prec$

Suppose ϕ is as before. Then by $o(\phi)$ we denote the class of functions f with

$$f/\phi \to 0$$

By $f \prec \phi$ we mean that $f \in o(\phi)$

1.4 $\sim$

By $f \sim \phi$ we mean that

$$f/\phi \to 1$$