阅读

The section that corresponds to the material for this problem set is Section 2.10. However, HPS’s exposition is quite technical, so I cannot fully recommend this reading unless you have taken a course in abstract algebra (e.g., Math 120). I explain what to do more practically for the first problem, below.

问题来自 HPS — 在线版本的编号方案

1. 2.37

In this problem, elements of the field look like $a + bx + cx^2$ where $a, b, c \in \mathbb{F}_2$ (so they are all either 0 or 1 mod 2) and $x$ is a symbol that satisfies $x^3 + x + 1 = 0$. In particular, $x^3 = 1 + x$ (since $-x - 1 = x + 1$ when operating over $\mathbb{F}_2$), so for example

$$(1 + x^2)(1 + x^2) = 1 + x^2 + x^2 + x^4$$
$$= 1 + x^4$$
$$= 1 + x(x^3)$$
$$= 1 + x(1 + x) = 1 + x + x^2$$

2. 2.40(a,b)—but read parts (c) and (d), these are pretty important to understanding finite fields.

WIM 描述和话题

A short description of the Writing in the Major (WIM) project has been uploaded to the course website, as well as a list of suggested topics.

By Tuesday, I would like you to have an idea of what topic you would like to write about for your WIM project, so take some time this weekend to look over the suggested topics and think about what appeals to you. Your topic choice will be due along with this problem set (but if you need more time or help choosing a topic, email me and we can discuss).

In addition to the blurbs I’ve written for each of the topics I came up with, feel free to search around on the internet for more information if a particular topic grabs your attention—Wikipedia is generally a reasonably good source for general information on mathematical topics. Some projects are more technical than others (requiring either a great deal of background material), and some are more open-ended (meaning I am not sure what your goals would be for such a project, but they are open to discussion).

If you would like to write about a topic that is not on the list of suggestions, email me and I can take a look!