Graph coloring

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April 9, 2017

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Chapter 1

Preface

These lecture notes...

Chapter 2

Temporary

2.1 Notation

A graph is $G = (V, E)$ and it has $n = |V|$, $m = |E|$. If there are more graphs the next one is H. A coloring with c colors is a function $f : V \to \{1, \ldots, c\} = C$. The chromatic number is χ. A bipartite graph has parts A, B, or X, Y.

2.2 Aha foo bar

This is just a testing ground for now.

Here is ade finition

Definition 1. *We say that a* definition *is a definition is*

$$\int_M d\omega = \int_{\partial M} \omega \tag{2.1}$$

On the other hand, here is a remark:

Remark 2. I would like the contents of a remark not to be italicised.

2.3 Section

It would be good to split each chapter into 2-4 sections.

2.4 Including sage code

We include SAGE source code like this:

```
def FunnyGraph(n):
    c = graphs.CompleteGraph(n)
    c.delete_edges(graphs.CycleGraph(n).edges())
    return graphs.MycielskiStep(c).join(graphs.WheelGraph(n+1))

G = FunnyGraph(99)
```

At the very end I will implement it using a pygmentize highlighter for python.

Figures can be drawn in tikz or whatever, or included from another file. In any case, it would be good to have every figure inside a figure environment with a label and caption.

2.5 TODOs

List of todos for MA:

- Remove this file
- Add pygmentize
- Expand and check bibliography

Chapter 3

Basic graph theory

Roughly lex1.tex and lec2.tex without defining chromatic number.

Chapter 4

Vertex coloring

Define chromatic number and the lec3.tex, lec4.tex

Chapter 5

Planar graphs

Roughly lec5.tex, lec6.tex

Chapter 6

Chromatic polynomial

Roughly lec7.tex, lec8.tex

Chapter 7

Edge coloring

Roughly lec9.tex, lec10.tex

Chapter 8

Chromatic number of Euclidean spaces

Roughly lec11.tex, lec12.tex, lec13.tex

Chapter 9

Coloring and topology

To be written up, MA

Chapter 10

Exam problems

To be written, MA

Bibliography

[D] R. Diestel, Graph Theory, Graduate Texts in Mathematics 173, Springer–Verlag