Undergraduate Mathematics Seminar Topic: SOMETHING

NAME*

January 7, 2019

A main goal for part I of the Undergraduate Mathematics Seminar is to develop a topic on which you can give an hour public seminar in part II of this course. This documents guides your development and serves as a template for your Topic Proposal (Section 1) and Topic Content (Section 2). Text in this color are instructions; do not delete them. Text in this color are things to delete and replace.

1 Proposal

1.1 Introduction

In one or two paragraphs, explain your idea for the topic. Argue that this topic meets the topic guidelines on:

- Appropriate Size.
- The topic should be very interesting to the presenter and also interesting to the audience.

Your text.

1.2 Outline

Give a detailed outline of the subtopics, examples, and main points of your topic. This should be only an outline; actual content goes in Section 2.

- subtopic
- example
- subtopic
  - subsubtopic
  - example
  -
-

1.3 Summary of how previously studied mathematics topics are used

Relate the topic to specific material in specific courses. Argue that this topic meets the topic guidelines on:

- Non-Duplicative.
- Appropriate Level for the Audience.
- Appropriate Level for the Presenter.

Your text.

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1.4 Sources about the topic

Describe the sources to be used. If they are long sources, such as books, then specific sections or pages should be indicated.

Your text.

1.4.1 Bibliography

Include full citations of the sources you are using.

- first source
- second source
-

2 Content

Present the actual content of the talk, in detail. The goal is to have all the content done now, so that next semester you only need to work on the mechanics of giving a good talk.

Organize the content in subsections and subsubsections following your outline in Section 1.2.

As you develop your content, you are encouraged to put in placeholders for things you plan to do but have not done yet, such as "[Include figure on X from source Y.]"

2.1 Introduction

Your text.

2.1.1 Your text.

2.1.2 Your text.

2.2 Your text.

2.2.1 Your text.

2.2.2 Your text.

2.3 Your text.

2.3.1 Your text.

2.3.2 Your text.

2.4 Conclusion

Your text.

Here are some examples of LaTeX formatting that you can copy, paste, and modify.

Inline math is coded as $x + 2y^2 - \frac{1}{z} = \pi^{4\omega}$. Displayed math in one line is done as

$$\int_a^b f(t)dt = F(t)\Big|_a^b = F(b) - F(a)\,. \tag{1}$$

Here we refer to (1) with automatic numbering.

Figure 1: Ohio logo

Displayed math in multiple line with alignment is done like

$$f'(x) = e^{-ax^2}(-2ax) \quad \text{and} \tag{2}$$

$$f''(x) = e^{-ax^2}(-2ax)(-2ax) + e^{-ax^2}(-2a) = 2ae^{-ax^2}(2ax^2 - 1)\,. \tag{3}$$

The calculation

$$\begin{aligned} f''(x) &= \lim_{h\to 0} \frac{f'(x+h) - f'(x)}{h} \qquad (4)\\ &= \lim_{h\to 0} \frac{6(x+h) - 6x}{h} \\ &= \lim_{h\to 0} \frac{6h}{h} \\ &= \lim_{h\to 0} 6 = 6 \qquad (5) \end{aligned}$$

continued over several lines and had some excess numbering suppressed. Arrays work like

$$\left[\begin{array}{cc|c} 1 & -1/2 & x/2 \\ 0 & 3/2 & 3x/2 \end{array}\right]. \tag{6}$$

Included figures are done like Figure 1. They will float to a spot where they fit.