Your First Presentation

For your first presentation you will be discussing a problem modeled after example 2.3.7 in *Analysis: With an Introduction to Proof*, by Steven R. Lay, 5th ed. and the discussion of $f(x) = |x|$ in Lecture 5, Slide 3 (p. 5 of pdf).

Presentations will be written up in LaTeX using the beamer package and recorded using WebEx. Your presentation should be 3-4 minutes in length.

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It is recommended that you write out your solution to the questions below and practice your presentation several times! Practice will allow for the creation of a shorter recording.

Your presentation will require both written and verbal components.

Written Component

For the written component:

- The slides for your presentation will created using Beamer, a LaTeX package used to create slides. This .tex file is an example (with comments in the code) of how to use Beamer.
- For each part of your problem statement, create a slide for your presentation.
- Your slides should contain your function, including the specific domain and codomain you are considering written up in LaTeX code. Include a graph of your function - an example of inserting an image will be given later in the slides.
- You will display your slides in a pdf reader (for example Acrobat) in a way that your slides take up all or nearly all of your screen.

Verbal Component

For the verbal component:

- You will record yourself presenting your slides by starting a WebEx session, sharing your screen that is displaying your pdf and recording your session **to the cloud**.
- Your presentation should include an introduction - "My name is __ and I will be discussing the function __."
- For each part, explain how you modified the original function given to you so that your new function satisfies the condition requested.
- Your explanation needs to involve **more than** reading what you have written on your slides.
- Include some kind of concluding statement when you have completed your presentation.

Presentation Notes

- See the video on presentations by Prof. Piper from Summer 2021 for more tips on how to give a good presentation. The link for this video is found on the last slide of this assignment. This is a discussion more on how to do a presentation of a proof - which we will do later in the semester - but still has some really good tips on how to prepare.
- The last slide of this assignment provides an example for how you will be adding the link to your presentation recording to your last slide.
- The last slide also includes the code needed to include an image into your slides. Your image can be a .jpg, .jpeg or .png.

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  Adding the url link is done after the recording and is not part of your presentation.

Check your Presentation before you submit it!

- Check your recording to make sure that there is nothing amiss.
- After adding your presentation link to the last slide, make sure to check that it correctly opens your recording and that your recording is playable.
- If you fail to provide a usable link to your presentation recording, you will receive no more than half the points for this assignment.

Your Assignment

Problem Statement: Consider $f(x) = (x-5)^2 - 2$ as a function from $f : \mathbb{R} \to \mathbb{R}$.

- Discuss in detail if f is surjective. Include an explanation of why or why not f is surjective. Define a (new) function $g(x) = (x-5)^2 - 2$ by replacing the domain with the largest possible set $A \subseteq \mathbb{R}$ or replacing the codomain with the largest possible set $B \subseteq \mathbb{R}$ that satisfies the definition of surjective.
- Discuss in detail if f is injective. Include an explanation of why or why not f is injective. Define a (new) function $h(x) = (x-5)^2 - 2$ by replacing the domain with the largest possible set $A \subseteq \mathbb{R}$ or replacing the codomain with the largest possible set $B \subseteq \mathbb{R}$ that satisfies the definition of injective.
- Lastly, define a new function $j(x) = (x-5)^2 - 2$ by determining the appropriate domain and codomain required for $j(x)$ to be a bijective function.

URL of your presentation on your last slide

The link to the the Presentation Video Tips from Summer 2021 can be found here.

You may link to a copy of your recording stored in WebEx or in your Box account (RPI provided accounts). Do not put the recording in a non-RPI location for us to access.

Include graphs of your functions by (1) drawing them by hand or using an app and creating a jpeg, jpg or png file to include in your slide, (2) drawing them by hand during your presentation or (3) coding your graphs in LaTeX code. To include an image file, modify the code in the .tex file that allows you to add the following graph: