# Emergency Calc

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## Abstract

Emergency calc will produce accurate calculations for basic math problems, as well as more rigorous calculations. The calculator will also be capable of creating two dimensional graphs using complex equations. It will include built in functions for compressing commonly used math functions to help simplify equations.

## Description

Emergency calc is a web-based calculator that will run off the HTML, JavaScript, TypeScript, and CSS programming languages. This program is intended for students as a calculator is a very useful tool for students taking STEM classes. This calculator will be able to solve basic and advanced math equations, have inbuilt formulas for important equations, and be able to create two dimensional graphs. It is web based to allow it to run off multiple operating systems and, in the future, would be adjusted to be mobile friendly so that more people could use it. This program is meant to help students get through their stem classes and be available to as many students as possible through the internet.

This calculator will provide students with a variety of features that are useful in STEM settings. It will have inbuilt TypeScript and JavaScript functions to mirror the use of a real graphing calculator. This involves functions for things like exponents, logarithms, natural log, and trigonometric equations. It will also contain premade values for important symbols in mathematics like Pi and e. It will have a built-in function for creating two dimensional graphs and a way to display them. A way to adjust the mode of the calculator will be included for trigonometric calculations. As one of the optional features it would have a way to export the graphs it creates into one of multiple file formats for use outside of the calculator. Another optional feature will be to save the previous results of the calculator. Hopefully it will be optimized for mobile use later.

This program will run using a variety of technologies that the team has a varying amount of experience with. We all have some experience with the programming languages we will be using, HTML, JavaScript, Typescript, and CSS. We might need to use Docker which is a technology that Eric has some experience with. We might also need to use a server to keep a record of previously run calculations.

This program will have some limitations and risks. The programming team has limited experience with the programming languages being used in this project. Along with that none of us are web developers so this is a different project then we would normally be working on. This should not be too much of an issue as we all have experience in multiple coding languages and techniques so we should be able to adapt these techniques to web development. Covid-19 is a risk that can’t really be avoided at this time. We will circumvent this challenge by performing much of the development online.

This calculator is meant to allow students access to a graphing calculator on the internet for use in basic and advanced stem classes. It will do this from a technical standpoint using a variety of programming languages and technologies. There are a couple of risks involved in this project, but the team has ways to get around these risks. This project will provide a variety of useful features from anywhere when needed.

## Feature List

### Features

* Trigonometric functions.
* Logarithmic functions
* Exponential functions
* Basic arithmetic functions
* Two-dimensional graphing functions
* A mode function

### Optional Features

* Ability to export created graphs to png, img, jpg.
* Ability to store completed calculations for ease of use.

### Features unable to implement

We will unfortunately not be able to implement mobile functionality. This could eventually be implemented, but given the time constraint, and the lack of mobile development experience, we want to focus on providing the actual product first before moving on to extra features.

## Technology

Our team will be using HTML, CSS, and JavaScript as the main coding languages. We may also use typescript as it will allow us to not only use JavaScript, but also make the code easier to read and debug. Since this is a web application, the calculator should be accessible on most operating systems, including Windows 10 and macOS. The use of docker will most likely be implemented. Unless there is a large issue that we run into, Docker will be used for the server. We will be using discord to communicate with the team.

## Developer Experience

* Weston: HTML, CSS, Some JavaScript
* Dylan: HTML, CSS, JavaScript, typescript
* Eric: HTML, CSS, typescript, docker

## Dependency limitations and risks

### Covid-19

Covid -19 is an issue to anyone doing anything currently. The virus provides several issues, but we have a way around this by being able to do most of this project online. This allows our group to work together efficiently without having to meet in person.

### Team has limited web experience.

Our team has very limited web experience which could become an issue since this is a web-based project. This shouldn’t really be an issue as our group has a large amount of programming experience and design experience that should allow us to adapt to web development. We also have experience learning new languages.

### Time

The team will only have a limited amount of time to complete this task, which appears will be about a month. This may prove difficult as we try to teach ourselves new skills and perform our other assignments for other classes. To prevent us from falling behind, we will work vigilantly and not procrastinate.