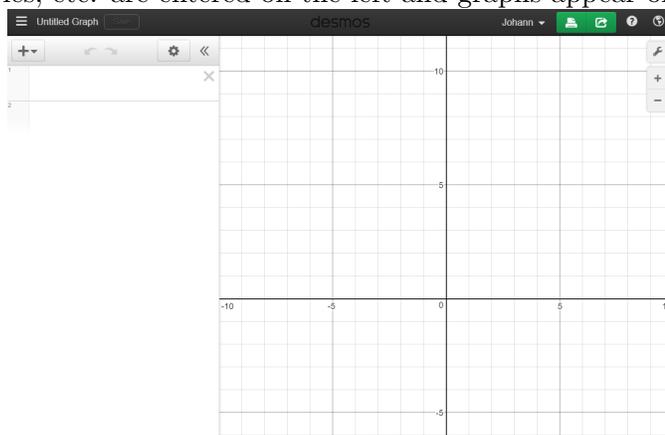


MAT1575 Module 0 – An introduction to Desmos.

Objectives: Learn to use some of the basic features of Desmos.

1. Go to <https://www.desmos.com> and create an account. This will help you create and manage your work. Once you have created an account, you can save your work and share it. For every workshop, make sure to save your work with your name, module number, and question number so that your peer-leader can observe/grade your work appropriately.
2. Desmos has many tutorials in the form of short videos here: <http://learn.desmos.com/calculator>.
3. Layout: functions, tables, etc. are entered on the left and graphs appear on the right.



4. Basics:

- (a) You can graph any function by entering its formula on the column to the left of the graph. It is recommended that you use function notation each time.

$$f(x) = x^2 - x - 3$$

Notes: Desmos likes to format your formula, so make sure that you do not enter the $-x-3$ part of the formula in the exponent (use the arrow keys to move around your formula). Also, you can refer to your function by other variables besides f , like $g(x)$ or $k(x)$.

- (b) Desmos automatically computes max/mins and intercepts. They are gray on the graph, but can be added by clicking on them.

- (c) You can zoom in and out on the graph by using the plus and minus signs on the right side of the screen.
- (d) You can compute the derivative of a function $f(x)$ in one of two ways:

$$f'(x)$$
$$d/dx f(x)$$

- (e) To compute a definite integral, type `int` and Desmos will automatically add an integral sign. Desmos cannot compute indefinite integrals, but it can apply the Fundamental Theorem of Calculus, Parts 1 and 2. **Note:** Make sure, if you integrate with respect to x that you include the dx in your integral.
- (f) If you add variables to your function that are not x , you can create sliders. This allows you to vary a value to see how it affects a graph.

$$g(x) = x^2 + a$$

5. Use Desmos to do the following:

- (a) Plot the function $f(x) = 3 \sin x + 2$.
- (b) Plot the derivative of $2e^x + \cos x$.
- (c) Find the local max/min values of $x^4 - 3x^3 + 2x + 5$.
- (d) Compute the value of $\int_1^3 \frac{1}{x} dx$.
- (e) Plot the function $g(x) = \sin(2x) + a$ for different values of a . How does the derivative of $g(x)$ differ for different values of a ? Enter your answer in the form of a note using the plus sign on the left side of the graph.