

Using the Desmos Calculator

Sara Larkin

sara.larkin@iaedb.org

Happy Hour for Project INSPIRE
February 29, 2024

Agenda

- Overview of Desmos calculators
- Features of the tools
- Accessibility keystrokes
- Demonstration
- Useful links

What is Desmos?

- Free suite of math software tools
- Already has many embedded accessibility features
- Works with screen readers
- Includes audio or braille input/output

Desmos Calculators

- What type of calculator does the student need?
 - Four-Function calculator
 - Scientific calculator
 - Graphing calculator
- www.desmos.com
 - Once on the page, press Ctrl+F, type four, scientific, or graphing, and hit Enter when on the link

Four Function Calculator

<https://www.desmos.com/fourfunction>

- Addition (+), Subtraction (-), Multiplication (*), Division (/)
- Decimals (.)
- Parentheses (shift-9 and shift-0)
- Square root (sqrt) – use right arrow to end root
- Ans key to use previous answer in a new calculation (ans)
- <https://www.desmos.com/fourfunctionshortcuts>

Scientific Calculator

<https://www.desmos.com/scientific>

- All entry for the four-function calculator PLUS
 - Fraction (frac) – use tab or arrow to move between numerator and denominator
 - Percent (%)
 - Exponent or Superscript (^ or Shift-6)
 - Square root (sqrt), Cube root (cbrrt), Nth root (nthroot)
 - Trigonometry (sin, cos, tan)
 - Pi (pi)
 - Extended functions menu for logarithms, probability, and more
 - <https://www.desmos.com/scientificshortcuts>

Poll #1

1. How do you type a square root?

- A. Type the word square
- B. Type the word root
- C. Type the letters sqrt

2. How do you use the previous answer in a new calculation?

- A. Type the word answer
- B. Type the word last
- C. Type the letters ans

3. How do you type a fraction?

- A. Type the word fraction
- B. Type the letters frac
- C. Type numerator/denominator

4. How do you type an exponent?

- A. Type the word exponent
- B. Type the letters exp
- C. Type the caret (^) which is shift-6

Graphing Calculator

<https://www.desmos.com/calculator>

- Includes everything on the scientific calculator PLUS
 - Table of values
 - Graphing of functions and inequalities on a coordinate plane
 - Statistics
 - Random number generator $[\#, \dots, \#].\text{random}$
 - Additional miscellaneous functions
 - <https://www.desmos.com/graphingshortcuts>

Graphing Keyboard Entry

- Navigating among equations and graphs
 - Focus on the expressions list (Ctrl-Alt-E)
 - Add an expression (Ctrl-Alt-X)
 - Delete the current expression (Ctrl-Shift-D)
 - Add a new table (Ctrl-Alt-T or type table)
 - Audio trace toggle to get to graph or back to equation (Alt-T)
 - Toggle answer between a decimal and a fraction (Alt-Shift-A)

Poll #2

1. How do you create a table?

- A. Type the word table
- B. Type the letters tab
- C. Ctrl-Alt-T

2. How do you add a new expression?

- A. Ctrl-Alt-X
- B. Ctrl-X
- C. Alt-X

3. How do you delete an expression?

- A. Ctrl-Alt-D
- B. Ctrl-Shift-D
- C. Alt-D

4. How do you use the audio trace toggle to go between the equation and the graph?

- A. Alt-T
- B. Ctrl-T
- C. Shift-T

Keystrokes When in the Graph

- Inside a graph, use the following:
 - Hear graph (H)
 - Point of interest (P) – only gives the # of points of interest
 - Beginning of graph – Home or Fn-Home
 - Next point of interest (Tab)
 - X coordinate (X)
 - Y coordinate (Y)
 - Move to origin (O)
 - Basic summary of graph (Alt-S)
 - Previous Graph – Alt-PageUp or Alt-UpArrow
 - Next Graph – Alt-PageDown or Alt-DownArrow

Poll #3

1. To Hear the graph, type this key.

- A. F
- B. G
- C. H

2. To find a Point of interest, type this key.

- A. I
- B. P
- C. Tab

3. To say the X-coordinate of the point, type this key.

- A. C
- B. P
- C. X

4. To say the Y-coordinate of the point, type this key.

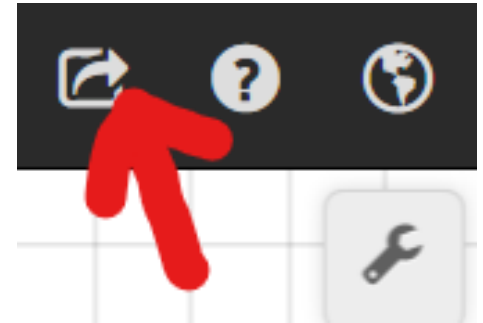
- A. C
- B. P
- C. Y

Line of Best Fit

- Make a table of points
- Go to the next expression by typing Ctrl-Alt-X
- Type $y_1 \sim mx_1 + b$
- Tab to the slope (m) and the y-intercept (b)

Sharing a Graph through Email

- Go to Share Graph (Ctrl-Alt-S)
- Use one of two options to copy link
 - Ctrl-C
 - Tab to Copy link and hit Enter
- Email to teacher or student

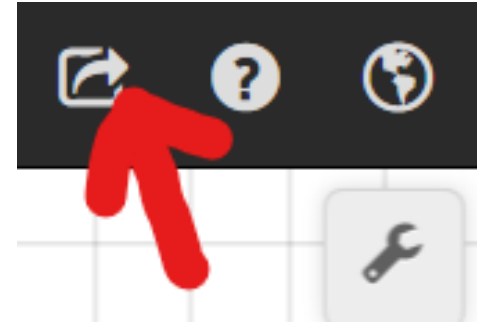


Embossing a Tactile Graph

For graphics embossers only

<https://www.desmos.com/accessibility#embossing-graphs>

- Go to Share Graph (Ctrl-Alt-S)
- Select Export Image button
- Expand the Size Dropdown Menu
- Select your graphics embosser under the Size Dropdown Menu (tab down if using a screen reader)
- Follow embossing instructions on the screen



Features in the settings (wrench icon)

- All Calculators
 - Large print display
 - Reverse contrast
 - Braille mode (refreshable braille display or ASCII)
- Scientific and Graphing Calculator
 - Radians or degrees for trigonometry
- Graphing Calculator
 - Grid properties

Using Braille

- More information
 - <https://www.desmos.com/accessibility#braille>
- Video for getting started
 - <https://learn.desmos.com/braille>
- Most of the students I work with tend to just prefer the keyboard and then emboss as needed.

General Troubleshooting

- JAWS
 - Disable keyboard echo (Insert-2 or Caps Lock-2)
 - Pass-through command (Insert-3 or Caps Lock-3)
- NVDA
 - Toggle browse mode on or off (Insert-Space)
 - Disable character echo (Insert-2 or Caps Lock-2)
 - Disable word echo (Insert-3 or Caps Lock-3)
 - Pass-through command (Insert-F2)
- If using braille, set your input and output to computer braille
- Support, questions, comments, suggestions
accessibility@desmos.com

Useful Links

- [Accessibility Page](#)
- [Keyboard Shortcuts for All Calculators](#)
- Downloadable Keyboard Shortcuts for graphing
 - [Graphing Calculator Keyboard Shortcuts for Windows \(.docx\)](#)
 - [Graphing Calculator Keyboard Shortcuts for Windows \(.brf\)](#)
 - [Graphing Calculator Keyboard Shortcuts for Mac \(.docx\)](#)
 - [Graphing Calculator Keyboard Shortcuts for Mac \(.brf\)](#)

Mathlete Competition

Happy Hour Information Session
Thursday February 7th, 2024

Saturdays beginning at
11:30 AM Eastern / 8:30 AM Pacific

- Junior Mathlete Practice – April 6 for 2 hours
- Senior Mathlete Practice – April 13 for 2 hours
- COMPETITION!!! – May 4 for 2 hours
- Award Ceremony – May 18 for 1 hour

[Mathlete Competition](#) website on Paths to Literacy