



# Professional Development Webinars

## A Back-to-School Tour of Your TI-84 Plus CE Technology

Summer 2020

[education.ti.com/tiwebinars](https://education.ti.com/tiwebinars)

# Moderator Bio



## **Mike Houston**

**T<sup>3</sup> National Instructor**

**Ellwood City, PA**

Mike is in his sixteenth year of teaching high school mathematics in Ellwood City, PA. While participating in a TI-Navigator™ Fast-Track in 2007, he learned how technology can effectively cultivate students' wide range of learning styles. During this time, Mike has served as a T<sup>3</sup> National Instructor and a contributing author for MathForward™.

## Panelists' Bios



**Valerie Hudson**

**T<sup>3</sup> Regional Instructor**

**Colleyville, TX**

**[vHUDSONMATH@gmail.com](mailto:vHUDSONMATH@gmail.com)**

Valerie Hudson is an educator with over 30 years of experience teaching middle and high school mathematics. Through her work with Texas Instruments' *MathForward* program, as an author of TI instructional materials, and activities as a consultant through the Texas Instruments Systemic, In-school Programs, Valerie loves to share her passion for technology as a vehicle for encouraging increased student achievement.

Twitter: [@vHUDSON\\_math](https://twitter.com/vHUDSON_math)



**Karen Campe**

**T<sup>3</sup> National Instructor**

**New Canaan, CT**

**[karen.campe@gmail.com](mailto:karen.campe@gmail.com)**

Karen was Instructor of Mathematics Education at Yale University for 15 years and previously taught high school and middle school mathematics for 13 years. She has been a T<sup>3</sup> National Instructor since 1998, and has been an author of materials for summer workshops and TI instructional websites. Karen speaks often on how to use technology effectively to enhance student understanding.

Twitter: [@KarenCampe](https://twitter.com/KarenCampe)

Blog: [karendcampe.wordpress.com](http://karendcampe.wordpress.com)

# Agenda

- Welcome & introductions
- Tips for online teaching with TI tools
- Tour of the TI-84 home screen & shortcut menus
- Use the TI-84 to develop understanding of functions, exponents, logs, & complex numbers.
- Transformation Graphing App
- Coding a Transformation
- TI Connect™ Software

## Expected Outcomes

### I Can

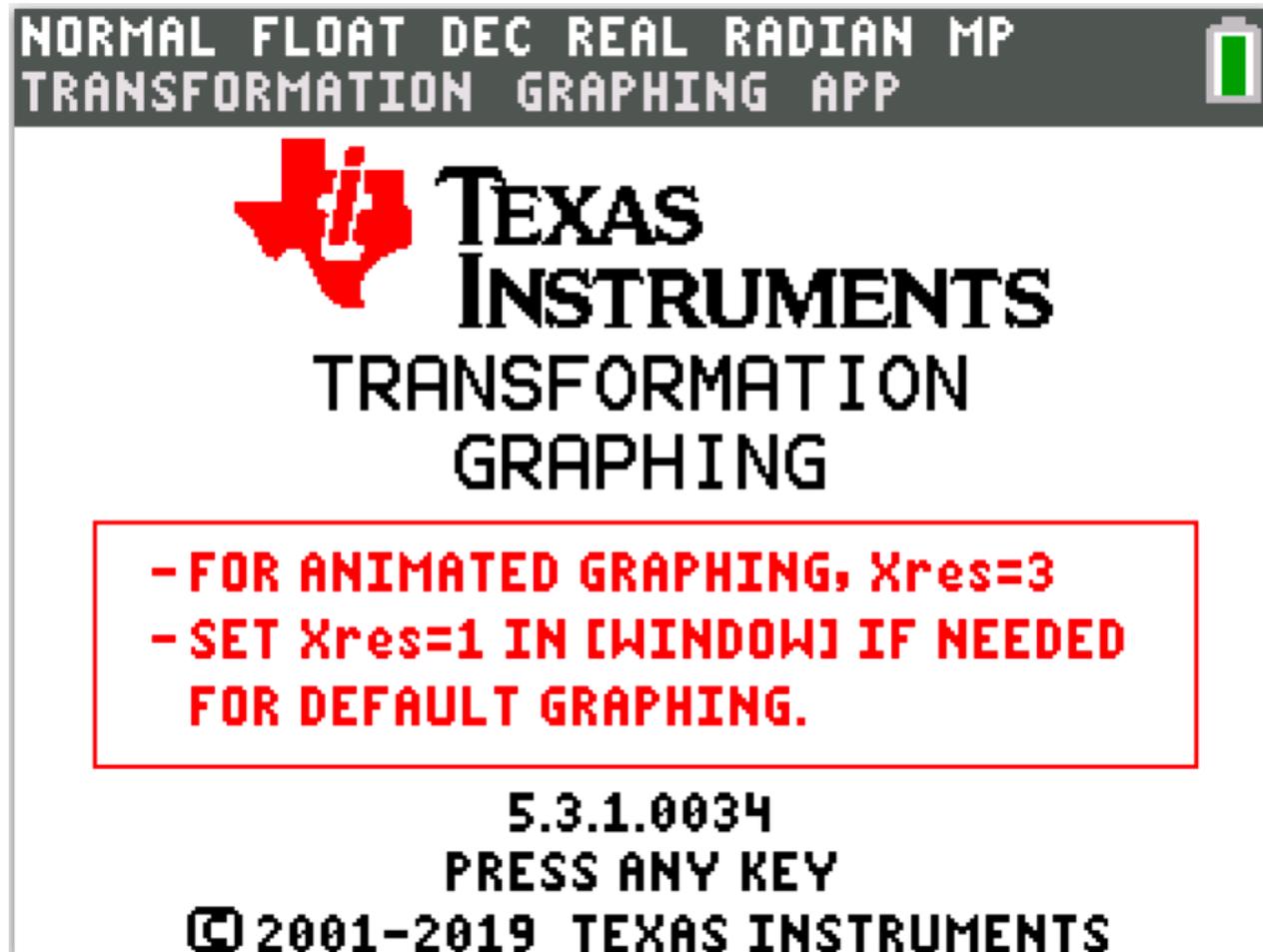
- Use the TI-84+ home screen & shortcut menus
- Choose an effective graphing window
- Use function notation for graphs & calculations
- Build understanding of exponents, logs, & complex numbers
- Open and use the Transformation Graphing App
- Code a randomly generated function
- Gain familiarity with TI Connect™ software

# Karen's Tour of the TI-84

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- » TI-Smartview & tips for online teaching
- » Tour of homescreen, history, edit, & shortcut menus
- » What is the best Window?
- » Function Notation in calculations & graphing
- » Exploring Exponents
- » Calculations & Inquiry with Logs & Complex Numbers

# Transformation Graphing App



# 84 Activity Central



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T<sup>3</sup>™ On-site Workshops focus on the most effective ways to use TI-84 Plus technology in middle grades and high school math curricula. [»»](#)



### Free online learning

On-demand T<sup>3</sup>™ Webinars explore strategies and tips for using TI-84 Plus technology and content to engage students in math learning. [»»](#)

# TI Connect™ CE Software

» Makes exchanging information between your graphing calculator and your computer quick and easy!

» Three workspaces:

- Calculator Explorer
- Screen Capture
- Program Editor

Get the right version

Determine which TI Connect™ CE software application version is right for your graphing calculator.

 <b>TI Connect™ CE software</b> Computer software for PC and Mac® computers that allows for connectivity between your computer and TI-84 Plus family graphing calculator. <a href="#">Learn more »</a> Graphing calculators supported: <ul style="list-style-type: none"><li>» TI-84 Plus CE</li><li>» TI-84 Plus C Silver Edition</li><li>» TI-84 Plus Silver Edition</li><li>» TI-84 Plus</li></ul>	 <b>TI Connect™ CE App for Chrome OS™ operating system</b> A concept application that runs on the Chrome OS™ operating system and allows for connectivity to a TI-84 Plus CE graphing calculator. <a href="#">Learn more »</a> Graphing calculators supported: <ul style="list-style-type: none"><li>» TI-84 Plus CE</li></ul>	 <b>TI Connect™ software</b> Free connectivity software for your non-color graphing calculator. <a href="#">Learn more »</a> Graphing calculators supported: <ul style="list-style-type: none"><li>» TI-73 Explorer™</li><li>» TI-83 and TI-83 Plus family</li><li>» TI-84 Plus C Silver Edition</li><li>» TI-84 Plus Silver Edition</li><li>» TI-84 Plus</li><li>» TI-86</li><li>» TI-89/TI-89 Titanium</li><li>» TI-92 and TI-92 Plus</li><li>» Voyage™ 200</li><li>» CBL™ data collection device</li><li>» CBR™ motion sensor (Mac® only)</li><li>» Vernier LabPro® (Mac® only)</li></ul>
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# TI Connect™ CE Software

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- » Three workspaces:
  - Calculator Explorer
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Get the right version

Determine which TI Connect™ CE software application version is right for your graphing calculator.

**TI Connect™ CE software**  
Computer software for PC and Mac® computers that allows for connectivity between your computer and TI-84 Plus family graphing calculator.  
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**TI Connect™ CE App for Chrome OS™ operating system**  
A concept application that runs on the Chrome OS™ operating system. It allows for connectivity to a TI-84 Plus C graphing calculator.  
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Free connectivity software for your non-color graphing calculator.  
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Graphing calculators supported:

- » TI-84 Plus CE
- » TI-84 Plus C Silver Edition
- » TI-84 Plus Silver Edition
- » TI-84 Plus
- » TI-86
- » TI-89/TI-89 Titanium
- » TI-92 and TI-92 Plus
- » Voyage™ 200
- » CBL™ data collection device
- » CBR™ motion sensor (Mac® only)
- » Vernier LabPro® (Mac® only)

# Planning to Program with a Focus on Transformations of Functions

In general, when graphing on the TI-84 CE what is \_\_\_\_\_ to have on the graph screen?

✓ Helpful

Not Helpful

# Planning to Program with a Focus on Transformations of Functions

In general, when graphing on the TI-84 CE what is \_\_\_\_\_ to have on the graph screen?

✓ Helpful	Not Helpful
✓ Axes	
✓ Gridlines	
✓ A helpful viewing window	
✓ The graph of the function	

# Planning to Program with a Focus on Transformations of Functions

**In general, when graphing on the TI-84 CE what is \_\_\_\_\_ to have on the graph screen?**

<b>✓ Helpful</b>	<b>Not Helpful</b>
<b>✓ Axes</b>	<b>Graphs of other functions</b>
<b>✓ Gridlines</b>	<b>Scatterplots</b>
<b>✓ A helpful viewing window</b>	<b>Drawn figures</b>
<b>✓ The graph of the function</b>	<b>Background visuals</b>

# What are additional items to consider regarding a potential program involving the transformation of a function?

- ✓ Randomize parameters
- ✓ Have the program enter the general equation in  $y=$
- ✓ Have the program graph the equation
- ✓ Optional: Include the parent function

# The Code

```
001 FnOff
002 PlotsOff
003 ClrDraw
004 BackgroundOff
005 AxesOn
006 GridLine
007 ZDecimal
```

- » 1. Turn off all  $y=$  functions
- » 2. Turn off all plots
- » 3. Clear all Drawings
- » 4. Turn off background visuals
- » 5. Turn on Axes
- » 6. Turn on Grid lines
- » 7. Zoom Decimal for nice trace numbers

# The Code (cont.)

```
008 0→V
009 0→K
010 randInt(-5,5)→V
011 randInt(-3,3)→K
012 "V*X+K"→Str0
```

- » 8. Initial value for  $V$
- » 9. Initial value for  $K$
- » 10. Random Integer between and including -5 and 5, stored in  $V$
- » 11. Random Integer between and including -3 and 3, stored in  $K$
- » 12. Converts the *value* of the expression to a string where the *value* can be real, complex, an evaluated expression, list, or matrix.

# The Code (cont.)

```
Ø13 String►Equ(StrØ, YØ)
```

```
Ø14 DispGraph
```

```
Ø15 "X"→Str9
```

```
Ø16 String►Equ(Str9, Y9)
```

```
Ø17 DispGraph
```

» 13. Converts *string* into an equation and stores the equation to  $Y_0$ .

» 14. Prompt to graph  $Y_0$ .

**Steps 15-17 are Optional—Linear Parent**

» 15. In order for the program to graph the linear parent, convert the *value* of the expression “x” to a string.

» 16. Converts *string* into an equation and stores the equation to  $Y_9$ .

» 17. Prompt to graph  $Y_9$ .

# Now That We Have Coded....

- » What do you think we will have to do to our code in order to create a random graph of a quadratic?
  - Randomize three parameters instead of two
  - Enter a general quadratic equation
  - Enter the quadratic parent, if desired

# TI Codes—10 Minutes of Code

Home »

## TI Codes: TI-84 Plus Technology

Introduce students to physical computing and put coding in motion with short activities for TI-84 Plus CE and TI-Innovator™ technology.



# TI's Response to Covid-19 and Remote Learning

- » **FREE SOFTWARE:** To support schools forced to close due to COVID-19, TI released a free trial of a beta version of our TI-84 Plus CE for Chrome OS™. The free trial runs through July 15, 2021. (There is a [form](#) to complete.)
- » **90 DAY TRIAL SOFTWARE:**



TI-SmartView™ CE  
Emulator Software for  
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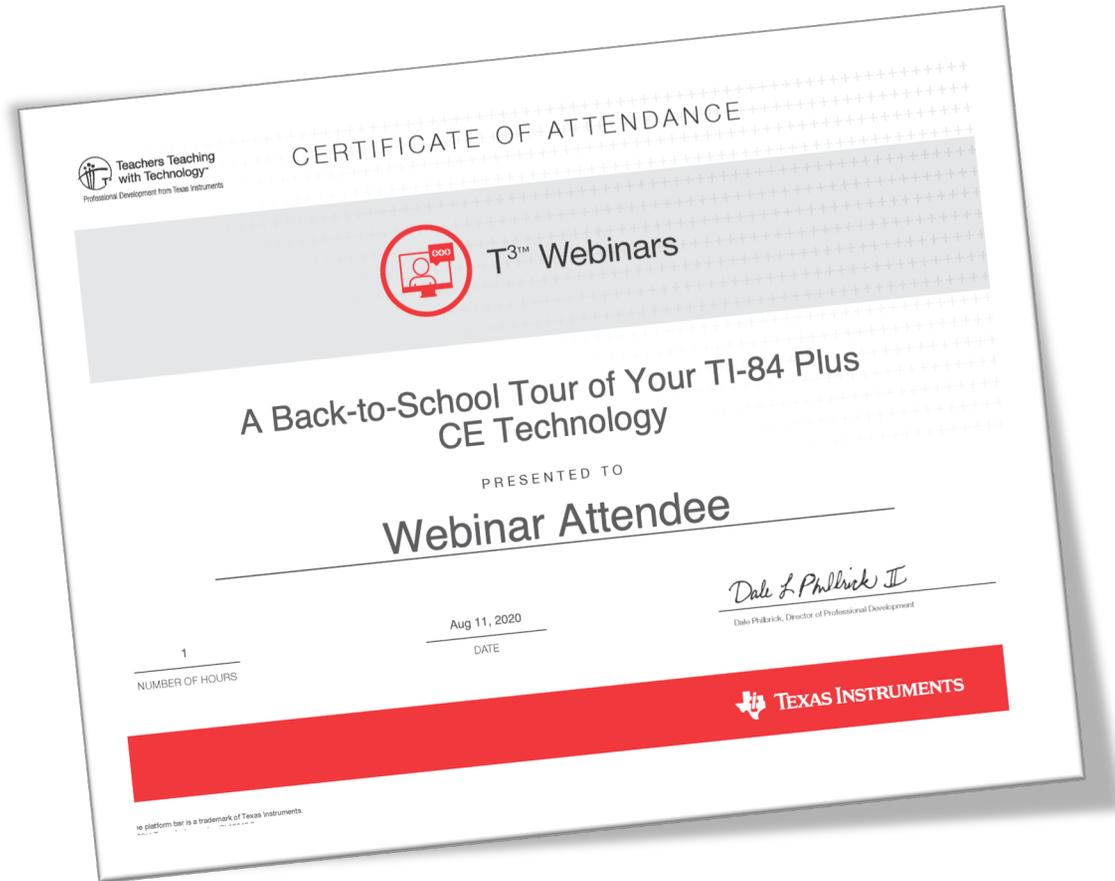
- » **CONTACT YOUR TI CONSULTANT:** For software licenses & more information, [email or call your TI rep.](#)

# TI's Response to Covid-19 and Remote Learning



- » **CALCULATOR LOANS:** Schools with economically disadvantaged students who do not have internet access at home can request to borrow TI graphing calculators, while supplies last. Please reach out to your [Educational Technology Consultant](#) to facilitate these requests.
- » **Video Lessons:** [@ticalculators YouTube channel](#) for a variety of video-based math and science lessons, technology tutorials and virtual professional development.

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