

Using Current Technology to Support and Improve Mathematics Instruction

(Double Session)

Presenters

- Vince Daniele: Introductions
- Karen Bochette and Marie Bernard Case :
Interpreting
- Joan Carr: Opening Comments
- Sharron Webster: MathXL & Math Gallery
- Patti Wink: TI-SmartView
- Miriam Santana: TI-Nspire

How Do These Technologies Enhance Instruction for Deaf Students?

- Concepts can be explored and demonstrated visually
- Visuals become the basis for conversations about mathematics
- Multiple examples are easy to generate
- Class discussions and notes can be captured

How Do These Technologies Enhance Instruction for Deaf Students?

- Students can participate in explorations
- Standard mathematical symbols are used
- Students expect technology to be a part of the learning experience
- Instructors become re-energized using new technologies

MathXL

www.mathxl.com

What is MathXL?

MathXL is a powerful online homework, tutorial, and assessment system that accompanies textbooks in Mathematics and Statistics.

What is MathXL good for?

- Distance Learning
- Large number of students
- Blended Learning

Basic Requirements

- **Internet connection**
 - Cable/DSL, T1, or other high-speed for multimedia content
 - 56k modem (minimum) for tutorials, homework, and testing.
- **Memory**
 - 64 MB RAM minimum
- **Monitor resolution**
 - 800 x 600 or higher (students), 1024 x 768 (instructors)

Basic Requirements (cont.)

- **Plug-ins**
 - MathXL Player
 - Requires Microsoft Windows and Internet Explorer 6.0.
 - **NEW:** MathXL Player, version 2
 - Starts in Fall 2008
 - Is compatible with MAC computers and all standard browsers

Basic Requirements (cont.)

- QuickTime Player
- Macromedia Flash Player
- Adobe Reader

Features for Instructors

- Powerful homework and test manager
- Custom exercise builder
- Comprehensive gradebook tracking
- Complete online course content and customization tools
- Copy or share courses and manage course groups

Features for Students

- Study plan for self-paced learning
- Interactive tutorial exercises
- Multimedia Learning Aids

Example: Picograph

“Help Me Solve This”

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More ?

At-Bat Record	
Home Runs	
Triples	
Doubles	
Singles	
Walks	
Outs	

 = 2 times at bat

Use the pictograph to the left.

How many of the player's at-bats were walks?

represent amounts. The actual amounts are not listed. The key tells what each symbol equals.

According to the key, each symbol represents 2 times at bat.


To calculate the number of walks, multiply the number of symbols in the row headed 'Walks' times 2.


The number of walks is 5.


The exercise is complete.


Back to Exercise


Problem Progress

 Help Me Solve This

 View an Example

 Textbook Pages

 Ask My Instructor...

 Print...

Example: Word Problem

An airplane is carrying 342 passengers. When it lands in Atlanta, 221 passengers get off the plane. How many passengers are left on the plane?

There are passengers left on the plane.

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$\frac{\square}{\square}$ \square^{\square}

More ?

Help Me Solve This

View an Example

Textbook Pages

Ask My Instructor...

Print...

Enter any number or expression in the blue-outlined box, then click Check Answer.

Check Answer Clear Answer

Problem Progress

This question is worth points

Example: Graph

Questions << 1 2 3 4 >>

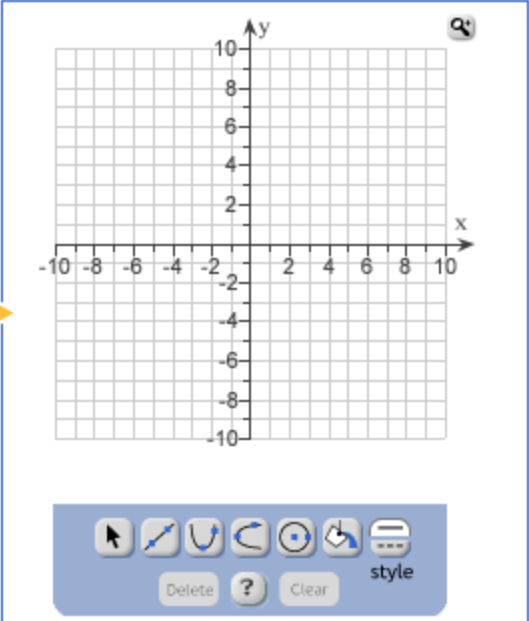
Sharron Webster

Graph using the slope and the y-intercept.

$$y = -\frac{1}{2}x + 2$$

Use the graphing tool to graph the line.
Use the slope and y-intercept when drawing the line.

Click to enlarge graph



To pop up your graph, click the Click to enlarge graph button.

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More ?

Help Me Solve This

View an Example

Textbook Pages

Ask My Instructor...

Print...

Exercise Score:
0 of 1 pts

Homework Score:
0% (0 of 4 pts)

Check Answer Clear Answer

Problem Progress

Submit Work

Student: Pros

- Available 24/7
- “Help Me Solve This” or “View Example”
- Immediate Feedback: 3 tries to get the answer right
- Opportunity to re-do incorrect problems (before due date)
- Quick Turn-Around Time for Grade
- Due Date Schedule
- Personalized study plan

Student: Cons

- Limit to PC platform (until Fall 2008)
- Language can be challenging for some students.
- Use MathXL as a game (not self-learning)
- Most video & animation are not captioned
- Captioned video is not easily accessible for Deaf/HH students.

Math Gallery

Notebook Software within SmartBoard

www.smarttech.com

What is Math Gallery?

- Backgrounds, clip art, pictures and multimedia content related to math stored in gallery (folder)
- Primarily use for instructor

Examples

- Ruler (image & flash)
- Trigonometric Transformation Program
- Best-Fit Line
- Dice

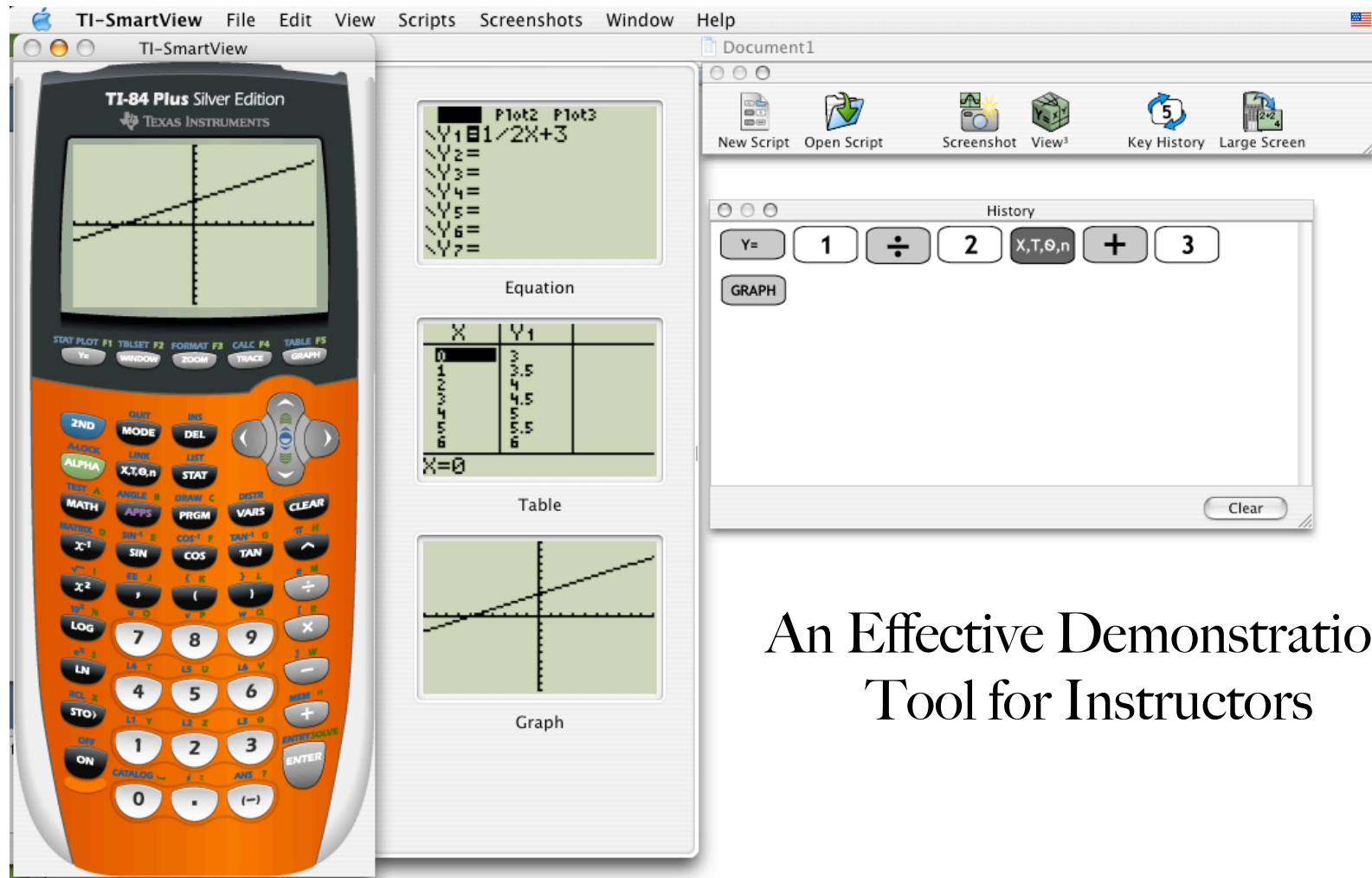
Pros

- User friendly
- Easy to copy & paste to other document
- Rotate/flip image
- Group lock multi-images as one image
- Search tool to find math image
- Free Notebook software to download
- Excellent Help feature (connect directly to the website)
- Prepared from your desktop

Cons

- Need to learn Notebook software
- Require Smart Board product
- Pointer needs alignment occasionally

TI-SmartView Emulator Software



An Effective Demonstration
Tool for Instructors

Benefits for Instructors

- An expanded calculator screen to show details in large or crowded classrooms
- An interactive representation of the calculator's display to the entire class

Benefits for Students

- Increase understanding of concepts and relationships
- Develop calculator skills

Pros

- Easily integrates with existing projection systems and interactive whiteboards
- Large vision of calculator keypad
- Three ways to maneuver a calculator on the Smartview:
 - computer (keyboard or mouse)
 - calculator as a remote keypad
 - interactive whiteboard (touching the buttons on the screen itself)

Pros (continued)

- Multiple representations simultaneously
 - Graph
 - Table
 - Equations
 - List window
 - STAT plot screens

Pros (continued)

- Key press history to the entire class
- Preloaded demonstrations (scripts) increase students' understanding the use of the calculator.
- Easily captures a screen display for documentation using the drag-and-drop or copy-and-paste feature.

Cons

- Slow response time
- Need to orient SmartBoard for accurate key pressing
- Calculator display not shown when use as a remote keypad
- Need TI-Connect software to download applications to TI-84 calculator
- Require OS 2.4 operating system on TI-84 calculator
- Different SmartView layouts for Mac and PC

Get Inspired in your classroom

Working with
TI-Nspire
By
Miriam Santana

- # Two Calculators in one
- TI-Nspire is not a regular calculator →
Handheld
 - Two key pads, and one handheld



The TI-Nspire Family Tools for your classroom

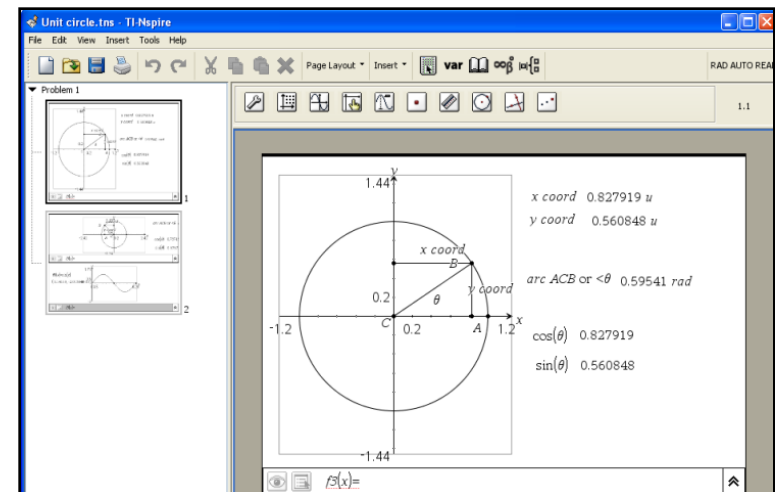
1. TI-Nspire
handheld

2. TI-Nspire
software



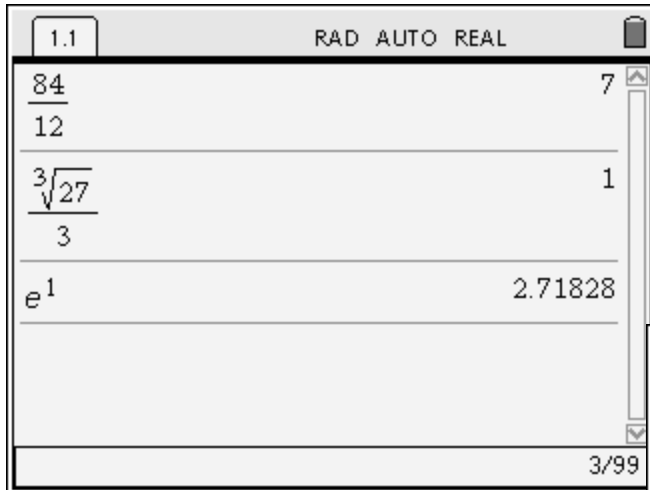
← 1. TI-Nspire
handheld

2. TI-Nspire
software →



TI-Nspire Applications/Tools

1. Calculator



3. Spread-Sheet

The spreadsheet interface shows a grid with columns labeled A through H and rows numbered 1 through 6. The grid is currently empty.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								
6								

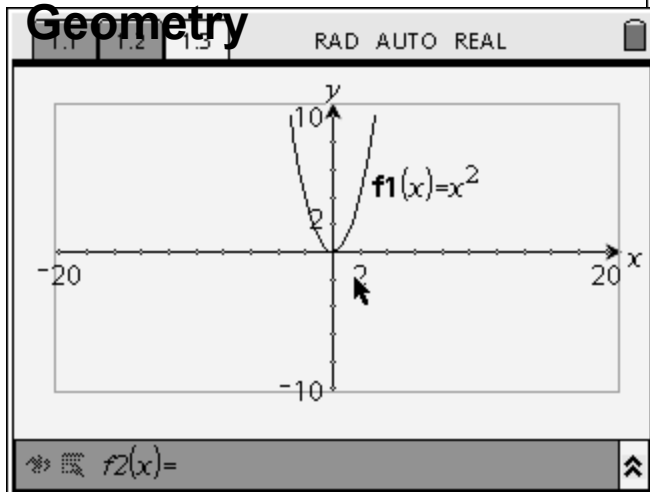
4. Notes

The notes interface shows a question and answer field:

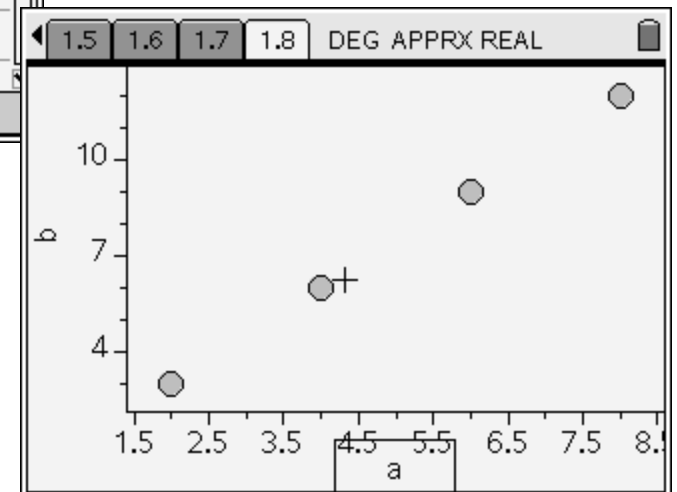
Question: What is the area of $\triangle ABC$?

Answer: [Empty field]

2. Graphs & Geometry



5. Statistics



Applications Overview

CALCULATOR

TI-84

$2/3+3/5$	1.3
$4 \sqrt[4]{81}$	3.0
$\log(16)$	1.2
$\ln(16)$ ■	

TI-Nspire:

- Enter and view expressions, equations and formulas exactly as they appear in math textbooks

TI-Nspire

1.1	1.2	2.1	2.2	DEG AUTO REAL	CRPS
$\frac{2}{3} + \frac{3}{5}$					$\frac{19}{15}$
$4\sqrt[4]{81}$					3
$\log_2(16)$					4.
$\begin{bmatrix} 1 & -2 \\ 4 & 3 \end{bmatrix} + \begin{bmatrix} 2 & 5 \\ -3 & -1 \end{bmatrix}$					$\begin{bmatrix} 3 & 3 \\ 1 & 2 \end{bmatrix}$
					4/4

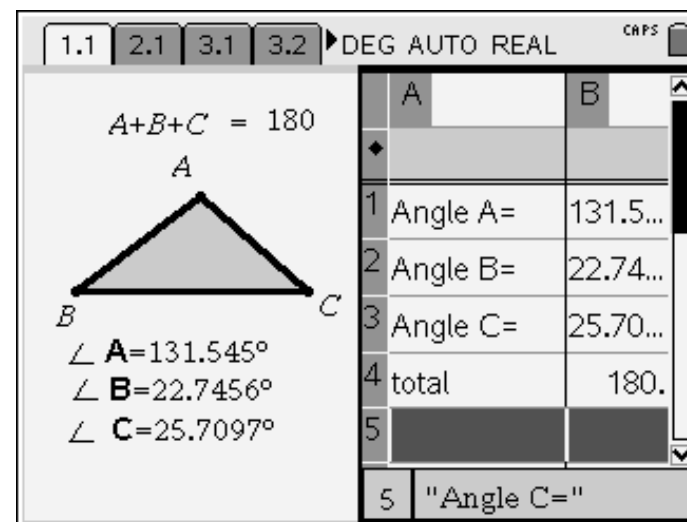
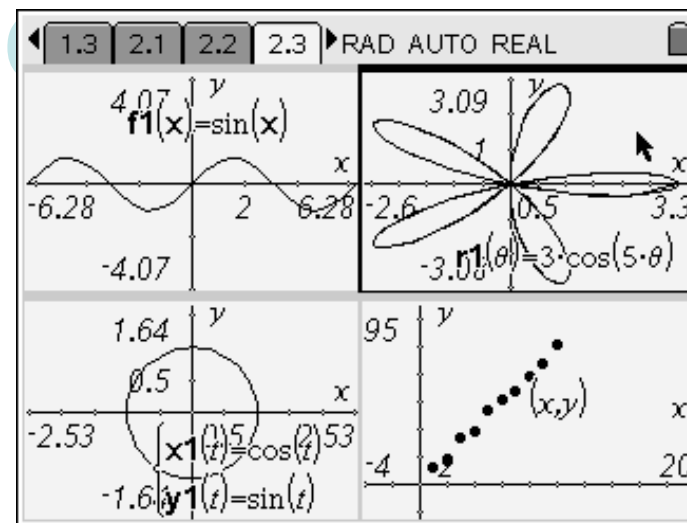
Applications Overview

GRAPHS & GEOMETRY

TI-Nspire

TI-Nspire:

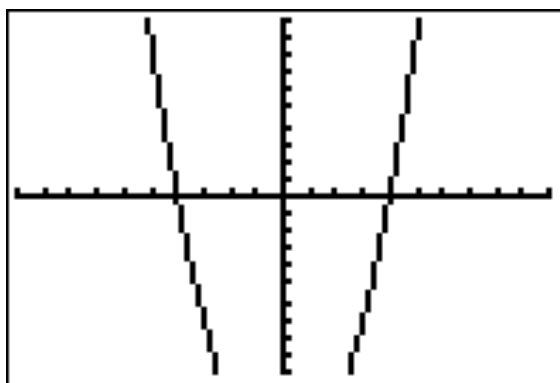
- Graph Trigonometric functions, Parametric functions, Polar functions and Scatter Plots.
- You can have them all in the same screen.
- Construct and explore geometric figures interactively and create animations.



Applications Overview

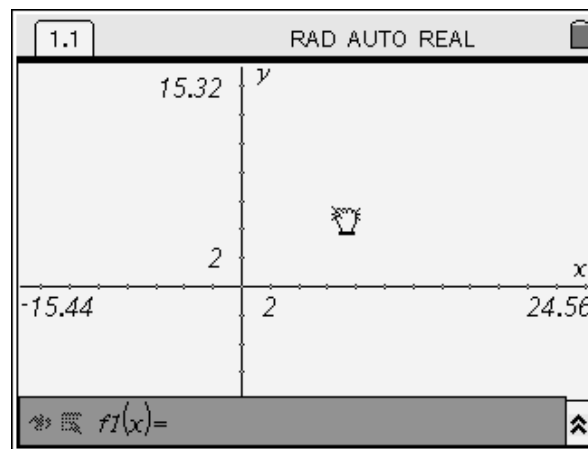
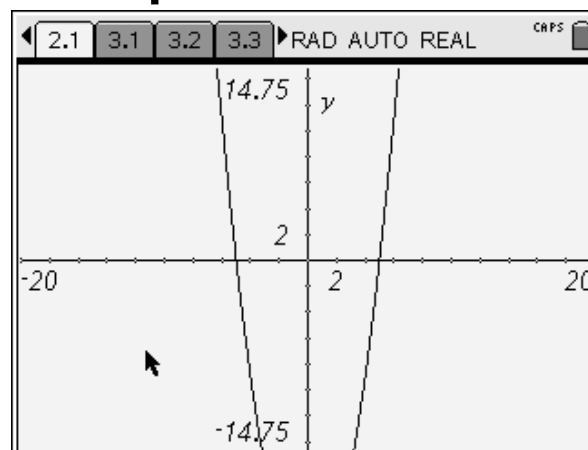
GRAPHS & GEOMETRY

TI-84



```
WINDOW
Xmin=-10
Xmax=10
Xscl=1
Ymin=-10
Ymax=10
Yscl=1
Xres=1
```

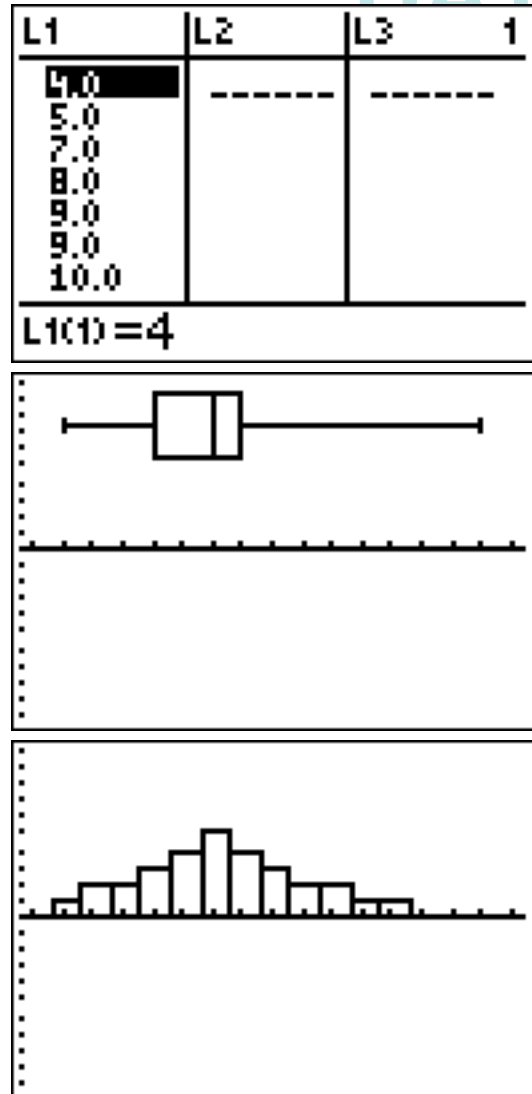
TI-Nspire



Applications Overview

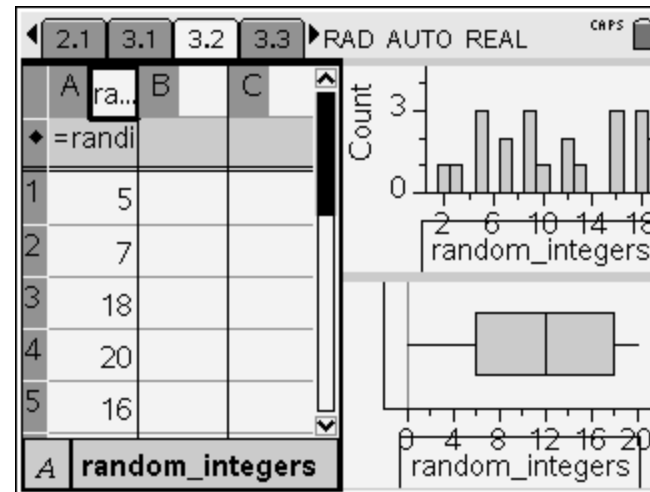
DATA & STATISTICS

TI-84



TI-Nspire

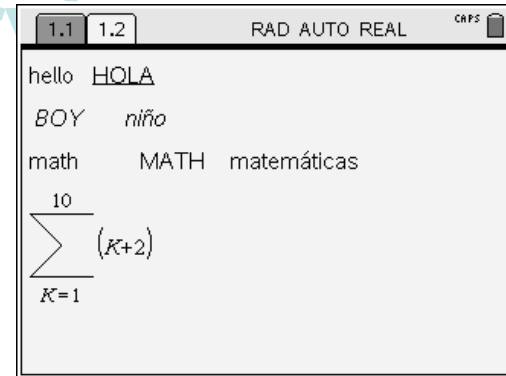
- Lists has been replaced by spreadsheet features similar to computer software.
- You can have these three representations on one page



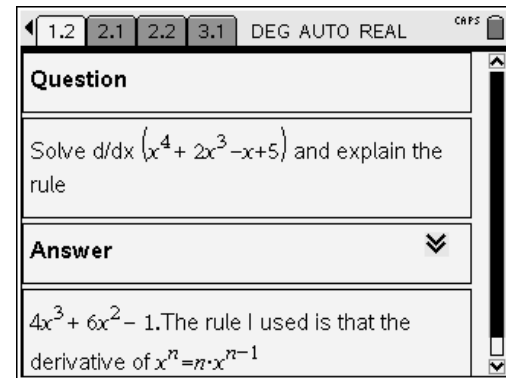
Applications Overview

NOTES

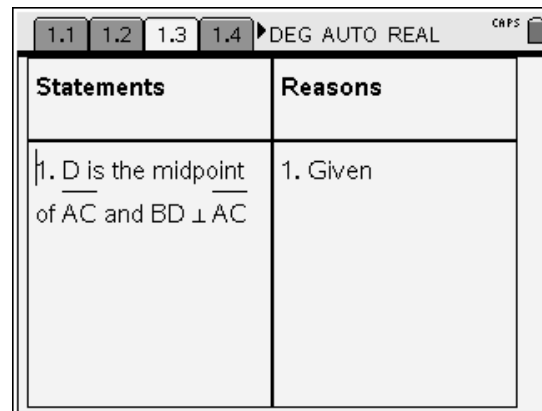
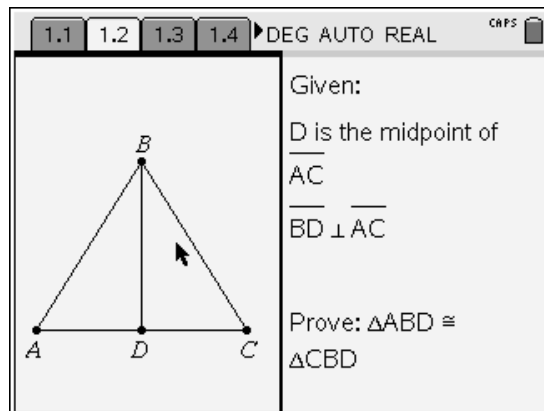
- Put the math in writing.
- Use 3 formats:
 - Default (Word Processor)
 - Q & A (Question and Answer)
 - Proof



1



2



TI-Nspire

3

Applications Overview

LISTS & SPREADSHEET

TI-84

- Experience capabilities similar to using computer spreadsheets:
 1. Label columns
 2. Insert formulas into cells
 3. Select individual cells, and change their size.

L1	L2	L3	1
5.0	1.0	-----	
5.0	2.0		
7.0	3.0		
8.0	4.0		
9.0	4.0		
9.0	1.0		
10.0	3.0		

L1(1)=4

TI-Nspire

1.2	2.1	2.2	3.1	DEG	AUTO	REAL	CHPS
A	B	cd	C	totalprice			
				=a\$2*cd+a\$4			
1	CD Price (\$)	1		22.5			
2	7.5	2		30.			
3	Shipping (\$)	3		37.5			
4	15	4		45.			
5		5		52.5			

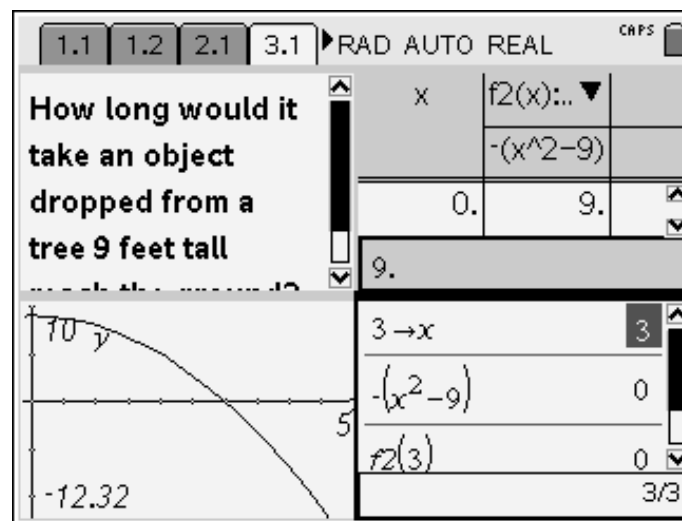
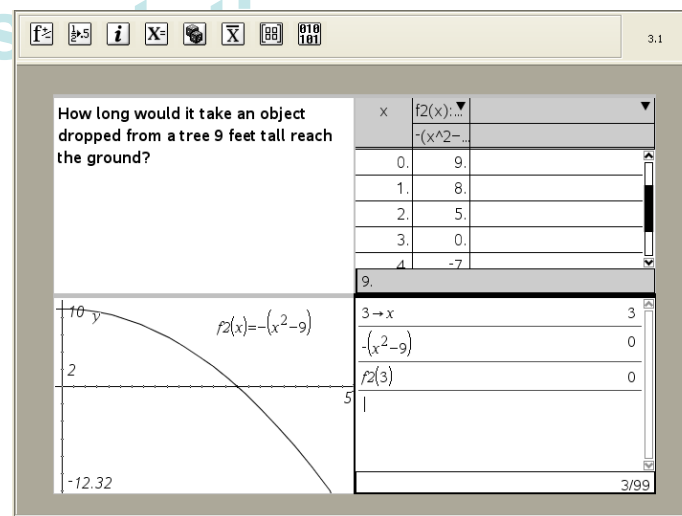
A1 "CD Price (\$)"

IMPORTANT FEATURES

- Multiple Representations
- Linking Representations
- Grab-and-Move Feature
- Interactive Geometry
- Save & Review Work

IMPORTANT FEATURES

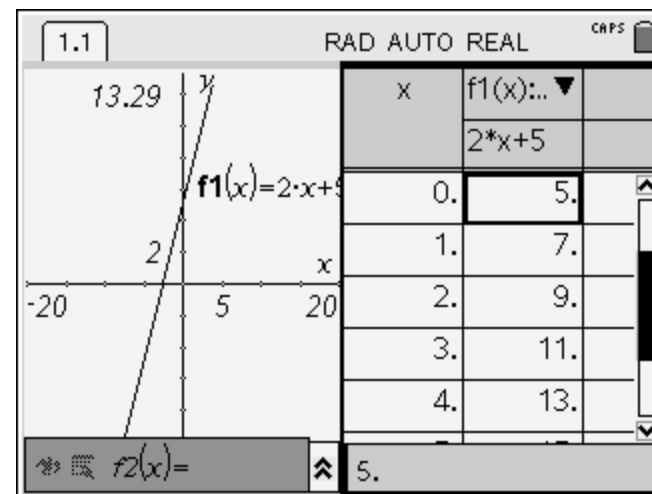
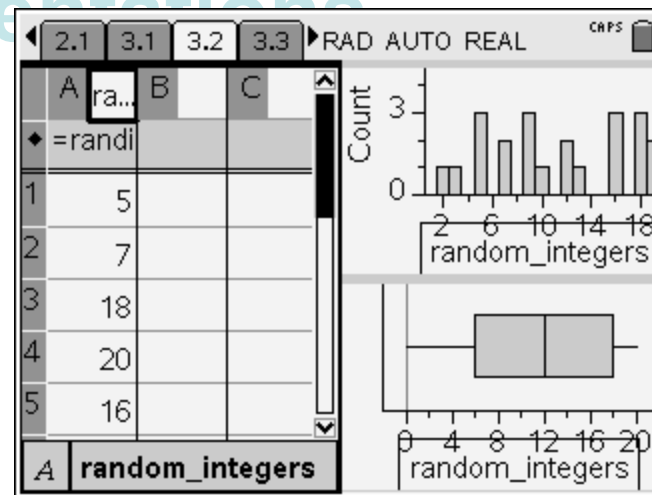
- View individual representations or as many as four on a single screen
- See and explore multiple representations of a problem: written, graphic, numeric, and algebraic forms



IMPORTANT FEATURES

Linking Representations

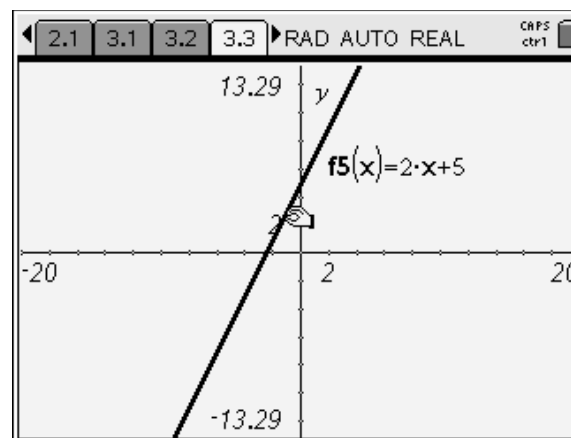
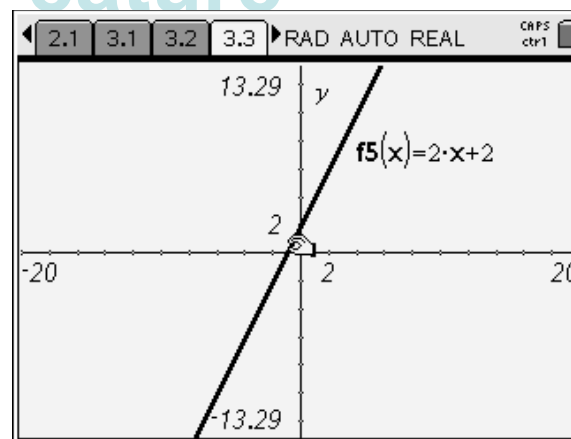
- The multiple representations of a problem can be dynamically linked
- The dynamic linking of representations provides real-time, interactive feedback: students are able to compare their predictions to actual outcomes.



IMPORTANT FEATURES

Grab-and-Move Feature

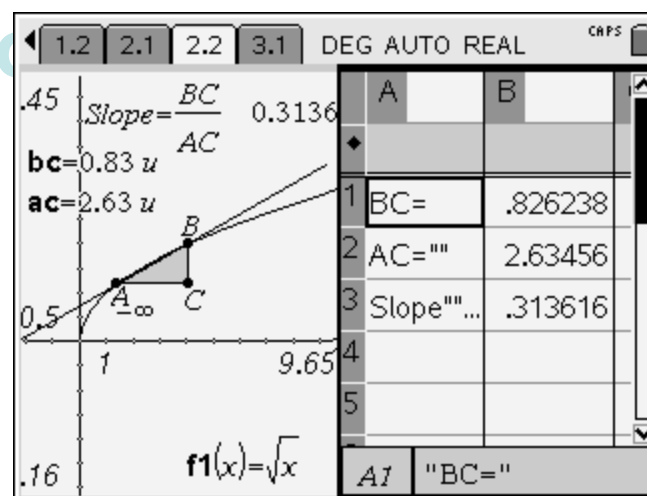
- “Grab-and-Move”
 1. Background
 2. Tick marks (scale)
 3. Functions
 4. Labels
- Manipulate the appearance of a graph function. The corresponding equations of each function will update automatically.



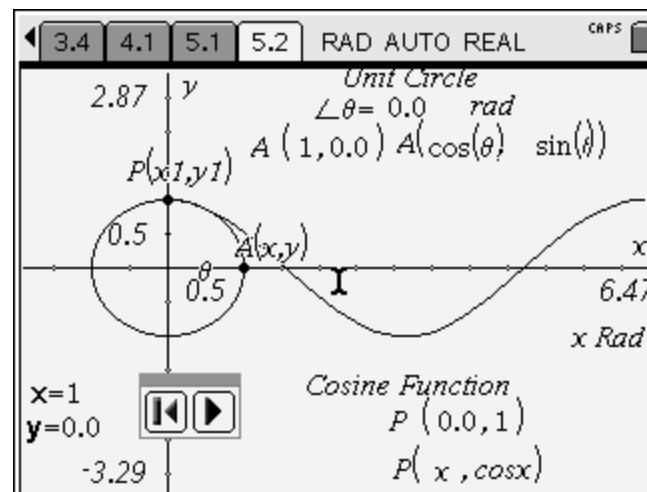
IMPORTANT FEATURES

Interactive Geo

- Interactive geometry capabilities.
 1. Measure angles and sides of polygons.
 2. Calculate surface area and slopes



- Students can discover and make conjectures about relationships and properties of geometric figures.

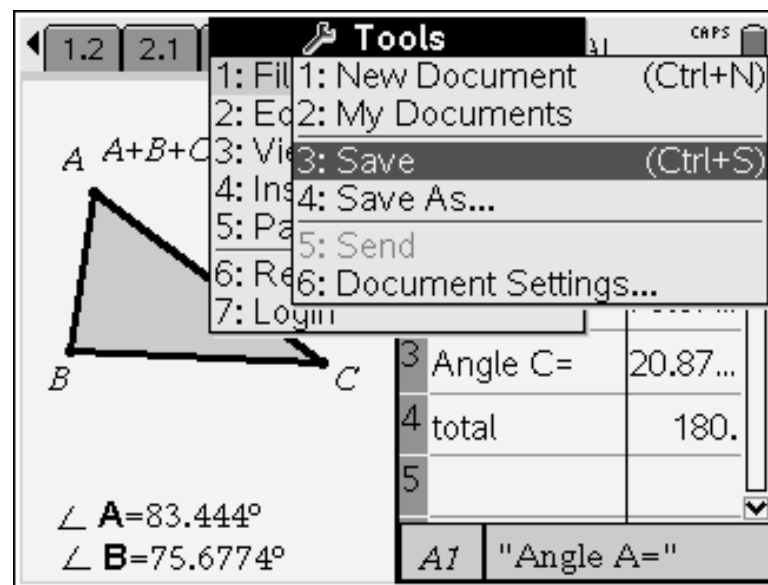


- Sketch and animate diagrams

IMPORTANT FEATURES

Save & Review Work

- Create, save, edit and view documents.
- Similar to the file storage features of a personal computer.



TI-Nspire Software

TI-Nspire

The screenshot displays the TI-Nspire software interface. The top menu bar includes File, Edit, View, Insert, Tools, and Help. Below the menu is a toolbar with various icons for file operations, editing, and mathematical functions. The main workspace is divided into two panes. The left pane, titled 'Problem 1', contains a list of problems. The first problem is 'Unit Circle for Minute Sensors' and the second is 'The Unit Circle'. The right pane is the main editing area, showing a function definition for $g(m, n)$. The function is defined as follows:

```
Define  $g(m, n)$ =Func Done  
  If  $m \geq 0$  Then  
    Return  $n$   
  Else  
    Return  $2 \cdot \pi - n$   
  EndIf  
EndFunc
```

The bottom right corner of the software window shows the page number 1/99.

Closing Remarks

Contact Us

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