



TEXAS INSTRUMENTS  
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227 TI-Nspire™ CAS Primer and Calculus with TI-Nspire™ Technology and SMART Board™ Technology

90-Minute Hands-On Beginner, Intermediate, Advanced TI-Nspire™ CAS  
Sean Bird, Covenant Christian High School, INDIANAPOLIS, IN, USA

From new users to those who want to learn about some of the more advanced features of TI-Nspire™ CAS technology, this sessions offers hands-on activities featuring the use of this integrated multiple representation math and science learning technology. Receive a handout of "TI-Nspire™ CAS Primer (especially for TI-83/84 users)" written by the presenter. Calculus .tns files of activities and explorations will be available and demonstrated using a SMART Board™ interactive whiteboard.




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Announcements:

<http://mathforum.org/electronic.newsletter/mf.intnews13.7.html>  
 Google Groups Discussion - TI-Nspire <http://groups.google.com/group/tinspire>

For users of the new TI-Nspire handheld, Rex Boggs has set up a moderated discussion group at Google Groups. The purpose of the discussion is to share knowledge and problems to make the technology more productive, enjoyable and enlightening.

If you are interested in becoming a member, please click on the link above and request to join the group.

- <http://cs3.covenantchristian.org/bird/Nspire.html>
- <http://cs3.covenantchristian.org/bird/Calculus.htm> - see the Calculus songs
- <http://mecas.org> **USACAS<sup>5</sup>** See orange flyer in folder

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## Outline

- ❑ Show of hands survey.  
83/84 users, 89/V200, GSP/Cabri
- ❑ Intro - My story
- ❑ SMART Board benefits summary
- ❑ Box Prob by Bird (*This is your hands-on activity*)
- ❑ Ways I have used the TI-Nspire CAS this year (*demonstration*)
- ❑ Song or Q&A/discussion

Purpose:

1. Get a vision for how it can be used
2. Become more comfortable using already made documents.

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my email [seanbird@covenantchristian.org](mailto:seanbird@covenantchristian.org) or [covenantbird@gmail.com](mailto:covenantbird@gmail.com)

Links

<http://groups.google.com/group/tinspire>  
<http://covenantchristian.org/bird/TTT.htm>  
<http://cs3.covenantchristian.org/bird/Nspire.html>  
<http://cs3.covenantchristian.org/bird/Calculus.htm> - see the Calculus songs  
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### How can I improve my teaching with a SMART Board & TI-Nspire

1. **COLORS** - never need to buy more markers (software is free too)
2. TI-Nspire software (like TI-Smartview) allows students to see what buttons I am actually pushing
3. Easily screen capture to give explanation or discuss
4. Saving class notes as powerpoint or pdf for posting.
5. Have links ready to be used
6. Teach the same class many times? shade
7. Improve notes and teaching from year to year
8. Video record
9. Drawing a straight line...
10. Attention getters



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- **Box Prob by Bird** (*This is your hands-on activity*)
- **Ways I have used the TI-Nspire CAS this year (demonstration)**
  1. **Summer Assignment** -*pass out the handout*
  2. **Aid in Calculus Explorations**  
- **Dynamic "scroll bars"**  
[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Explor02\\_4.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Explor02_4.tns)
  3. **Demonstrations - e.g. Volume from cross sections, Volume from discs or washers, shell method**  
[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8\\_5Vol10&12.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8_5Vol10&12.tns)  
[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8\\_6VolCylShell.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8_6VolCylShell.tns)  
[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8\\_5VolumeMC.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8_5VolumeMC.tns)
  4. **I had a sub (who never took calc) 'explain' the answers to a quiz**  
This is not available online.
  5. **'StudyCards' for the Nspire**  
<http://cs3.covenantchristian.org/bird/TTT/NspireCalc/ch8studycards.tns>

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□ Ways I have used the TI-Nspire CAS this year (demonstration)

**6. Programs** - develop concepts,  
encourage excellence in mathematical notation

derivative steps

Reimann in the library 😊

<http://cs3.covenantchristian.org/bird/TTT/NspireCalc/derivsteps.tns>

<http://cs3.covenantchristian.org/bird/TTT/NspireCalc/area.tns>

**7. Slope fields**

[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec7\\_4slopefield%20x+y%20ic%20dynamic.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec7_4slopefield%20x+y%20ic%20dynamic.tns)

**8. Implicit graphing, polar**

[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8\\_9heart.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/Sec8_9heart.tns)

[http://cs3.covenantchristian.org/bird/TTT/NspireCalc/func+polar\\_tracing.tns](http://cs3.covenantchristian.org/bird/TTT/NspireCalc/func+polar_tracing.tns)

**9. Solve in a limited domain**

**10. Do the 4 required calculator functions for the AP exam** - numerically integrate & differentiate, solve an equation, find zeros & intercepts

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**33. I Will Survive - AP Calc Version**

[Amy Pennington c/o 2002, Kentridge]

"I Will Survive" [tune](#)

At first I was afraid, I was petrified  
Kept thinkin' I could never take this test and stay alive  
But then I spent so many nights  
Studying so hard  
I stayed up late  
I learned how to integrate  
And so I'm here, to take this test  
I'll just walk in and sit right down  
I swear I'll do my best  
I should have studied all my trig  
I should have known related rates  
If I'd've known for just one second they'd be on the free response

Go on now, go  
Bring on the test  
Jump up and down now  
'Cause I know this is my quest  
Weren't you the one who tried to break me on the sly  
Did you think I'd crumble  
Did you think I'd lay down and die?  
Oh no, not !! I will survive  
Oh as long as I know how to think I know I'll stay alive  
I've got all my time to muse,  
I've got all my brain to use and I'll survive  
I'll get a five, hey, hey

It took all the strength I had to get my homework done  
Kept trying hard to learn the solids of revolution,  
And I spent oh so many nights  
Just feeling sorry for myself. I used to cry  
But now I hold my head up high  
And you see me Somebody free  
I'm not that failing little person that I used to be  
And so I'm all done with Cov'nant  
Off to college is where I am,  
Now I'm usin' all my knowledge  
for the AP calc exam  
Go on now go  
(back to chorus)

Feb 29-10:28 PM

## What is so great about the TI-Nspire?

1. Pretty Print
2. Dynamic relation between environments
3. Resolution (What if it is too small for your eyes?)
4. It even has grayscale
5. Geometry is integrated.
6. Animation
- 7a. TI-Nspire (not Nspire CAS) comes with TI-84 keypad  
- You get 2 for the price of 1.
- 7b. CAS has units (this is especially helpful with...)  
CAS has exploration & discovery possibilities in algebra
8. Notes - makes it so much more pedagogical.  
This really is a learning (& teaching) tool.
9. It is better than an 84 which only has a history of 10 that many of my students didn't even know existed. History of 99 for each page (50 pages max) in each of the 30 problems allowed in a single document.
10. **INEQUALITIES**  
**TRANSFORMATIONS**  
& no more false asymptotes  
slider bars

NOV 2-5:50 PM

In light of Thanksgiving, I thought I would put together a brief list of why I am thankful for the TI-Nspire (and therefore the people who designed it). There are so many improvements that are useful for students and teaching maths and science, but I'll limit myself to the first 10 that come to mind. Many of the following could be expanded and explained in more detail.

1. Pretty print on the input as well as the announcement. Students with 84s often make parentheses errors when they are doing real world type of problems. That will largely become a thing of the past, now that what they enter looks just like what it does on paper. My student with the 89 would type it in and then see their mistake in pretty print after they hit enter.
2. Dynamic relation between environments.  
More seamlessly approaching problems graphically, algebraically, numerically and verbally is a great way to improve depth of understanding of concepts.
3. Resolution (Some teachers find the resolution too good, i.e. the font is too small for their older eyes. There are at least two solutions: (i) There is an option of making the font larger, (ii) the software eliminates that problem.) It even has gray scale.
4. Geometry is integrated. I never got into Cabri Jr. on the 84 partially because I don't teach geometry and I'm familiar with Sketchpad for demonstration purposes. The resolution on the 84 was so limiting. Also geometry and graphing are combined now. This is extremely useful to elucidate all sorts of concepts.
5. Animation. Making graphs move can really help capture students' attention and improve understanding.
- 6a. TI-Nspire (not Nspire CAS) comes with TI-84 keypad. You get 2 for the price of 1 and you can still use your favorite apps or programs. I am partial to StudyCards and an app called Timer... that, once calibrated, makes every students 83/84 into a stopwatch.
- 6b. CAS has units with constants built in. This is particularly appreciated by chem and physics students. CAS has so many exploration and discovery possibilities for algebra students.
7. NOTES pages makes it so much more pedagogical. This really is a learning (& teaching) tool. I appreciate the keyboard layout. The alpha button was so annoying. I understand the for ACT, SAT, and AP tests they cannot use the QWERTY keyboard layout.
8. It graphs inequalities.
9. It does some amazing things with transformations for functions like  $y=x$ ,  $y=x^2$ ,  $y=\sin(x)$ ,  $y=e^x$ , ...
10. slider bars

Happy Thanksgiving,  
Sean

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