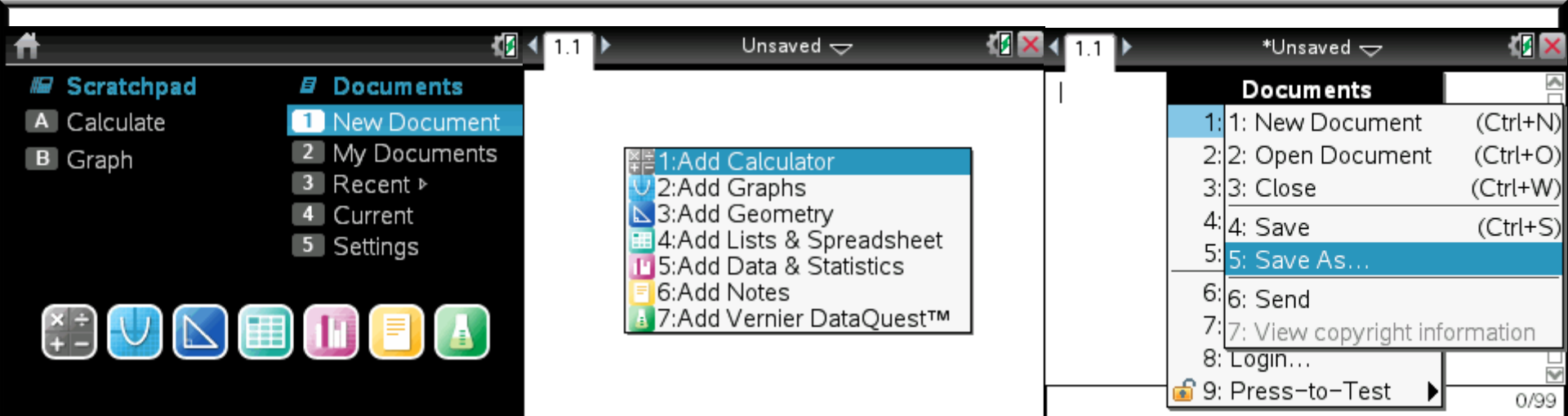




TI-nspire Calculator Tutorial

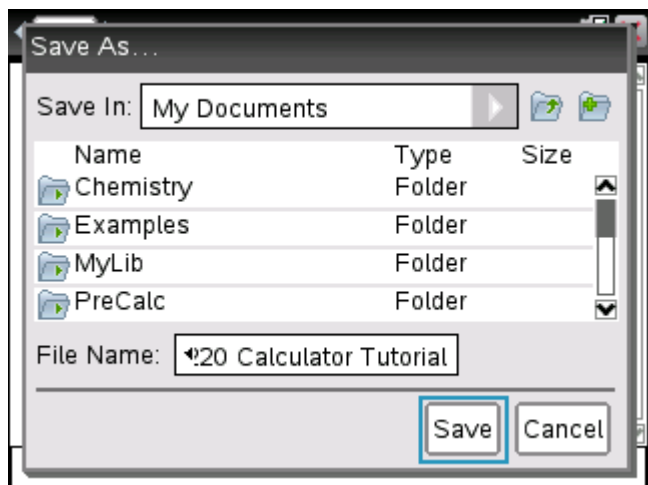
Created by Natalie Montoya for the
SDSM&T ECE Department



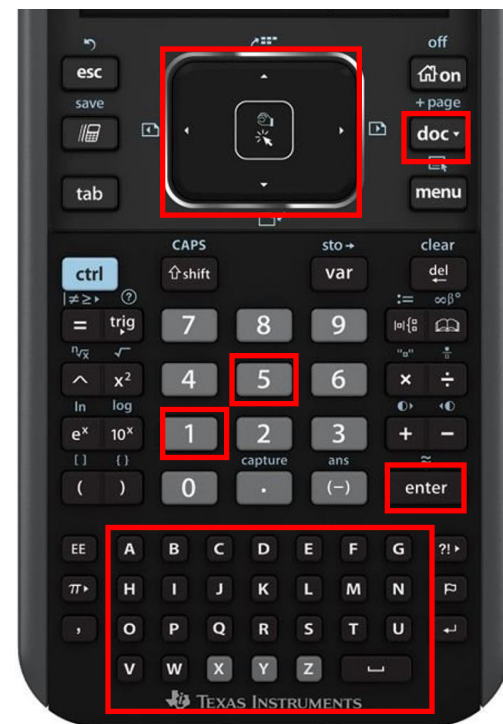
Turn on your calculator. On the home screen, press 1 to open a new document.

Press 1 again in order to open a calculator page.

Press <doc>, 1, then 5 to save the document.

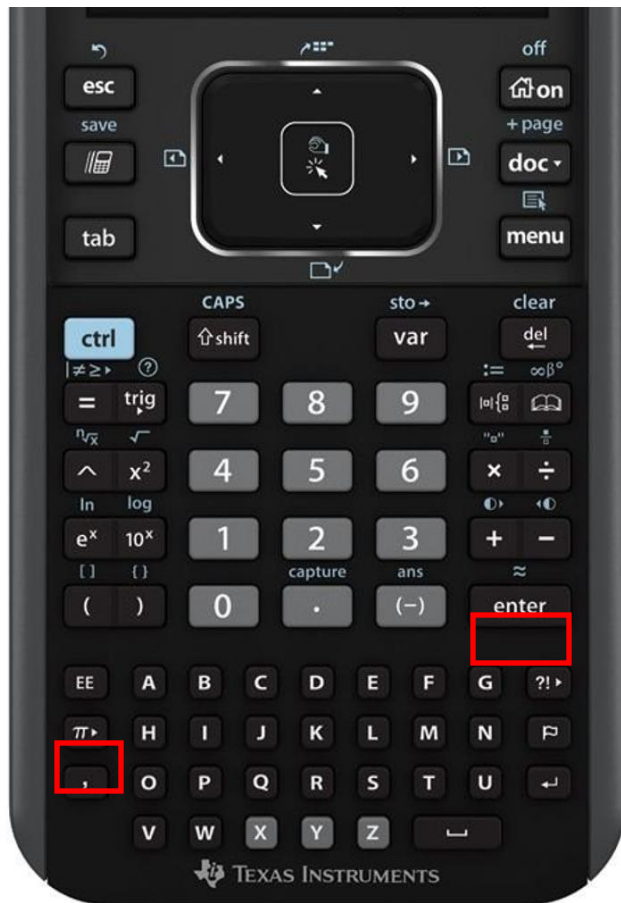


Select a folder and type a name for the document. The example is titled “EE220 Calculator Tutorial.” Press <enter> to save.



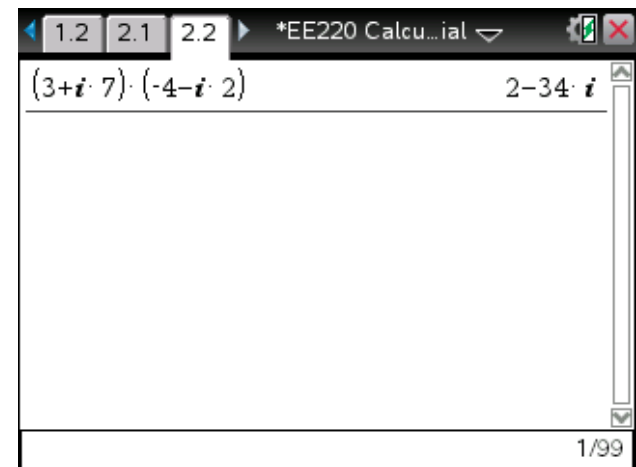
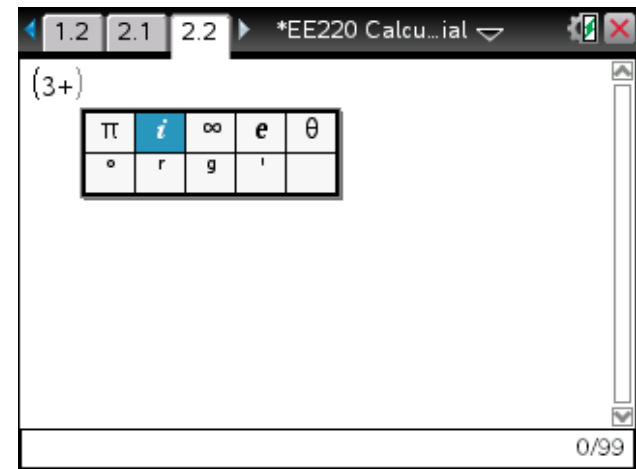
Solving Problems with Complex Numbers in Rectangular Format

e.g., a) $(3+j7)*(-4-j2)$



Problems with complex numbers in rectangular format can be simply typed into the calculator. To insert i (i.e., j), press the π button twice, or press it once and use the arrow keys to scroll. Click <enter> to insert i .

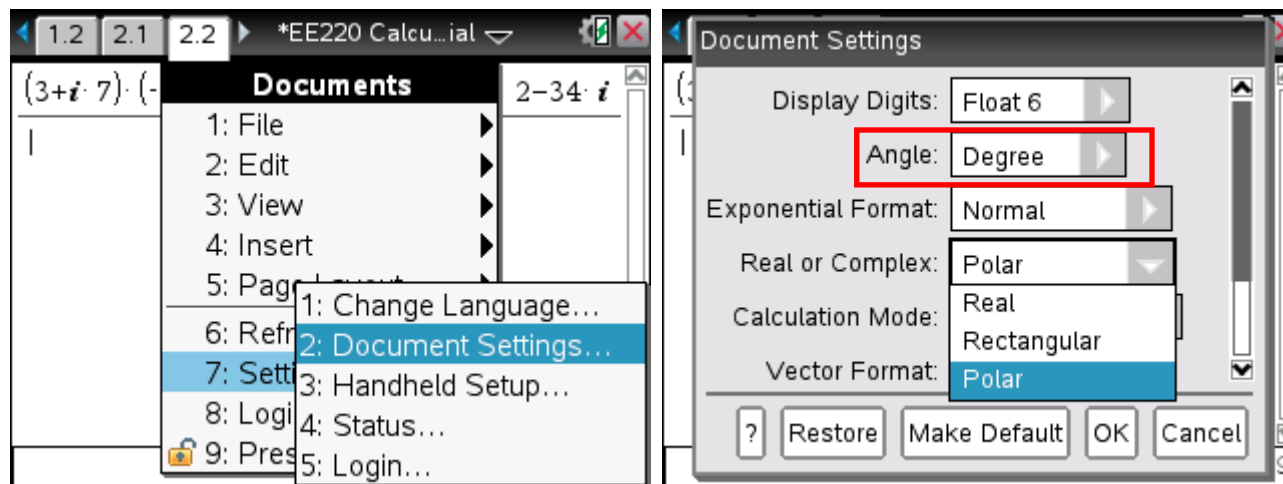
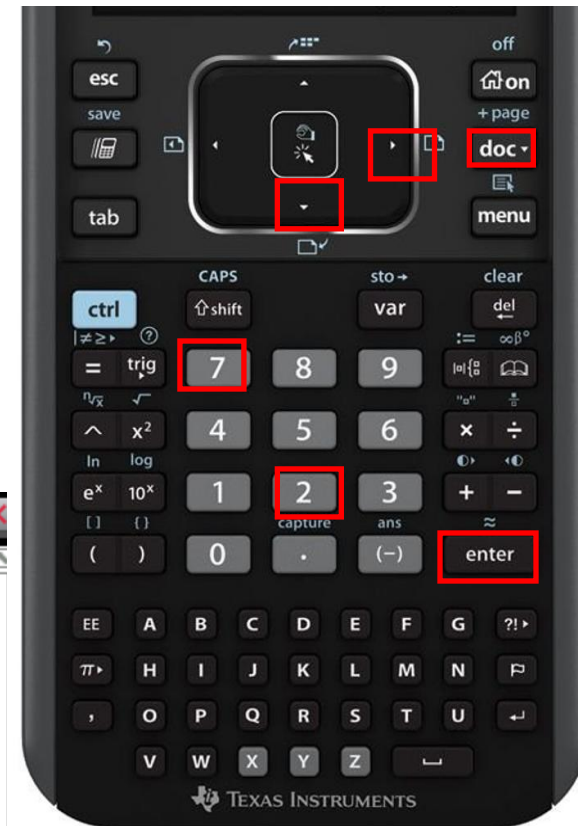
Input the entire problem as shown & press <enter> to obtain answer. Note: may need to press <ctl> <enter> to get a decimal answer.

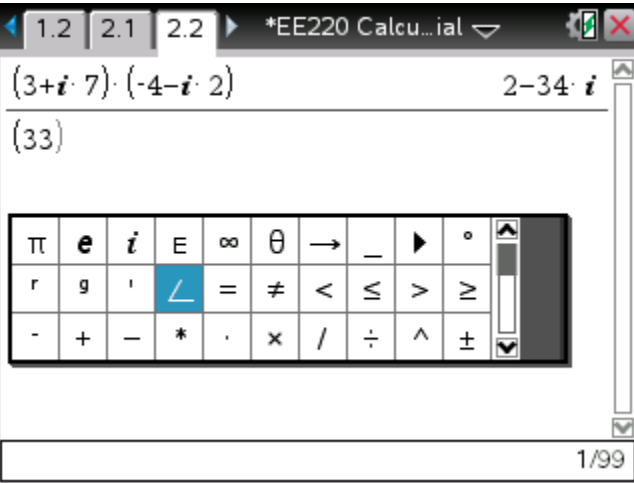



Solving Problems with Complex Numbers in Polar/Phasor Format

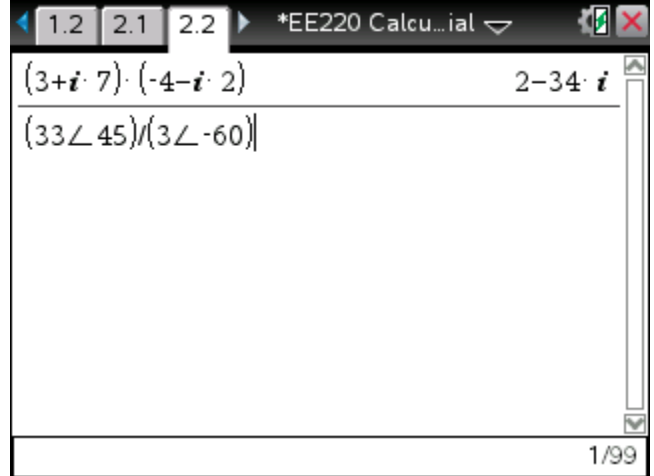
e.g., b) $(33\angle 45^\circ) / (3\angle -60^\circ)$

In order to solve problems in polar format, the settings must be changed. Click <doc>, 7, and then 2 to get to the document settings. Press the down arrow until 'Real or Complex' is highlighted. Press the right arrow and then scroll down to 'Polar'. Press <enter> twice to select and accept. Note: as long as the angle is in degrees, the degree symbol does not need to be typed.

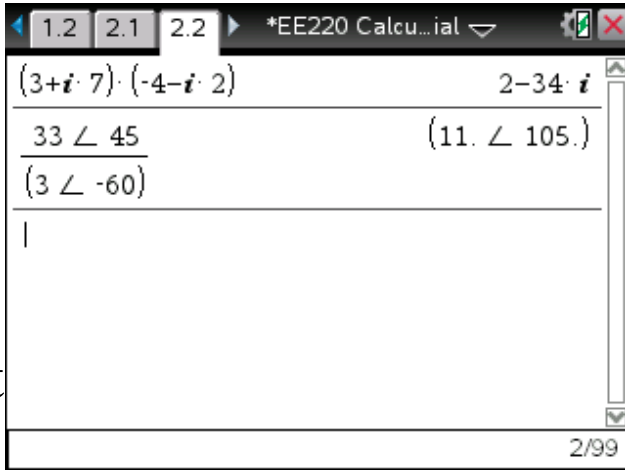





Begin entering the problem. To insert an \angle symbol, click <ctrl> and then press the  button. Scroll to the angle as highlighted and press <enter> to insert it. Finish typing the problem.

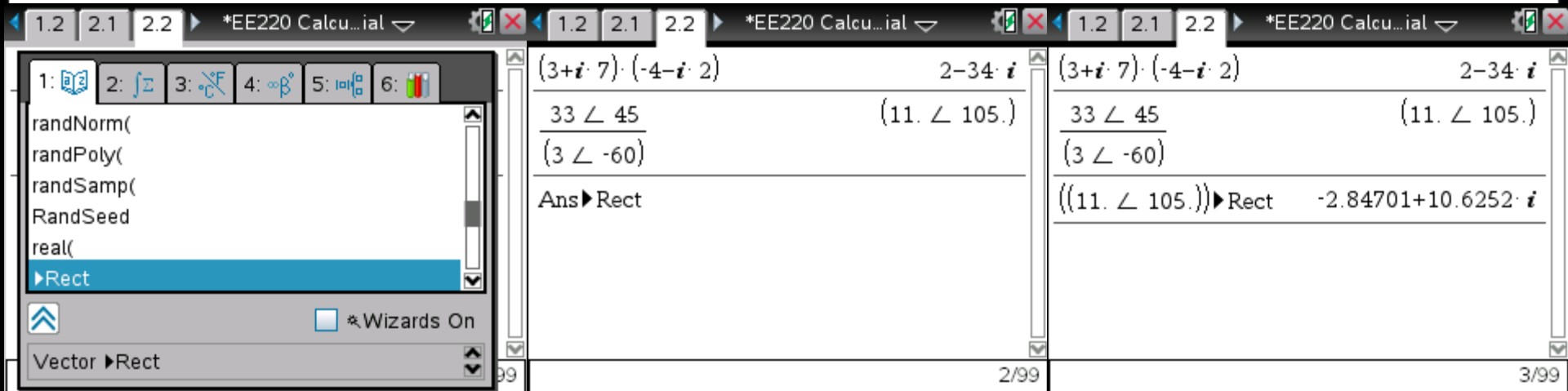
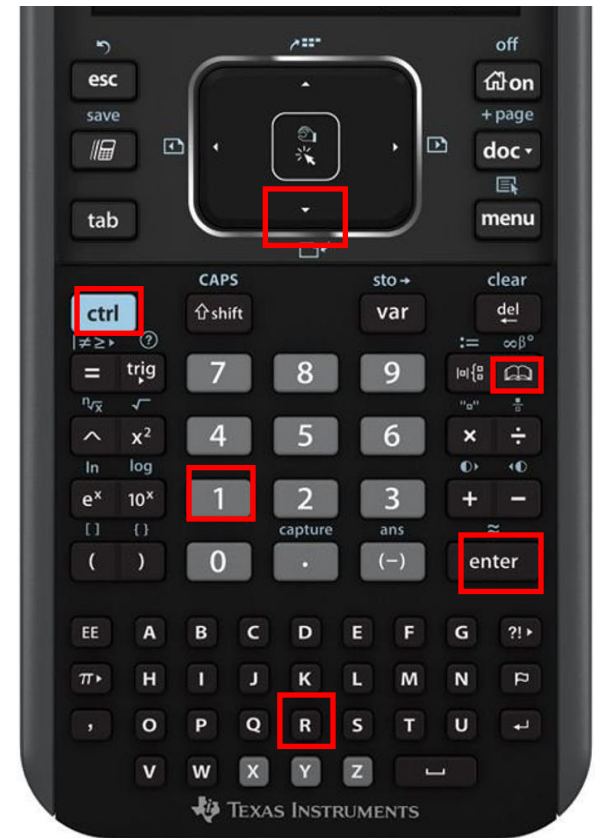



Note: For some problems, a fractional answer will be given. To obtain an approximate, i.e., decimal answer, click <ctrl> and then <enter>. The <ctrl> key does not need to be held down; calculator will acknowledge <ctrl> and <shift> until another button is pressed. [<caps> and <ctrl+shift> stay on until turned off]. The <ctrl>, <shift>, & <caps> keys are shown in the upper left corner.

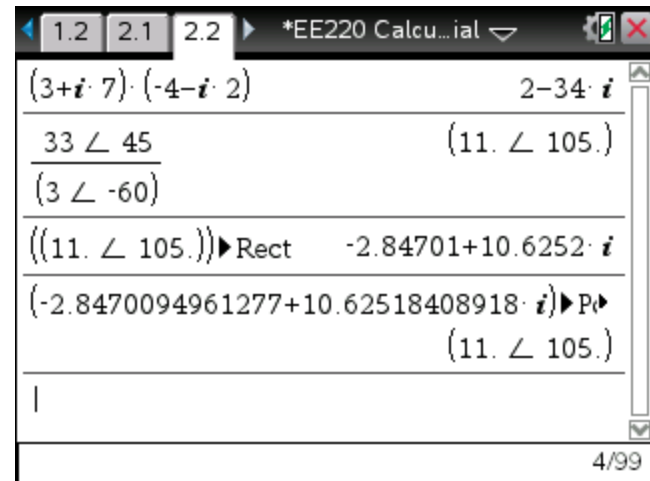
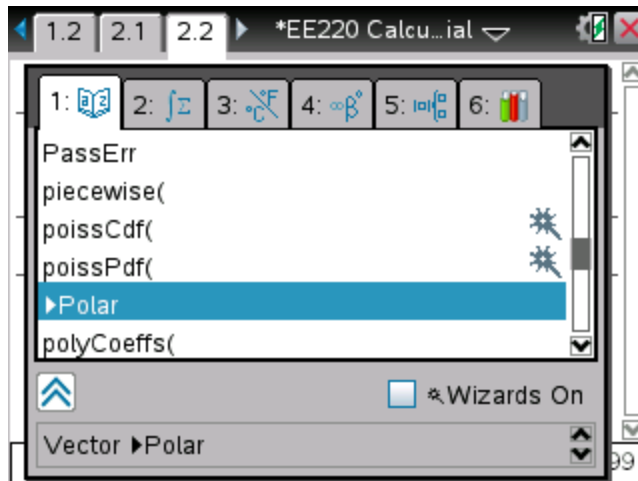
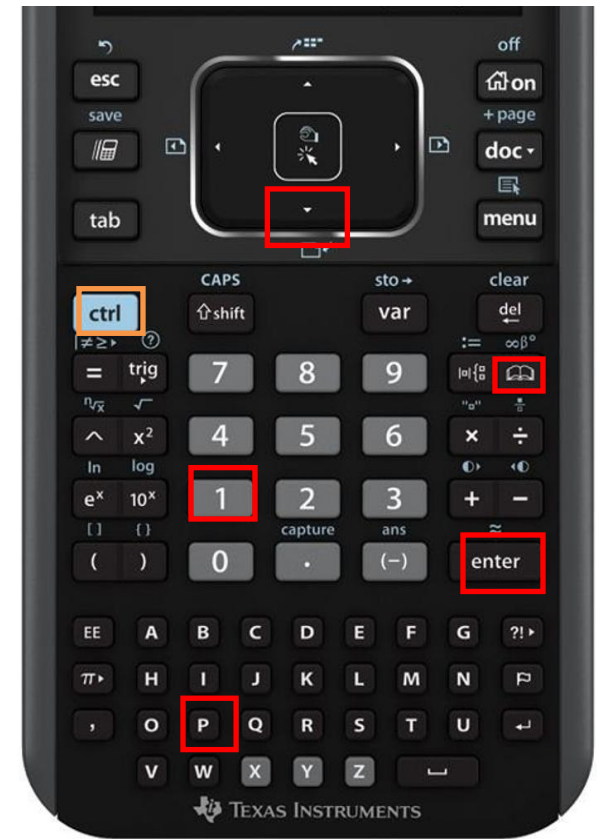


Converting Between Polar and Rectangular Formats

To convert a complex number in polar format to rectangular format, press the  button, and then 1 to get to the first tab. Press 'r' and scroll down to **►Rect** and click <enter>. Press <ctrl>+<enter> (<enter> alone will give a fractional answer) to show decimal answer.



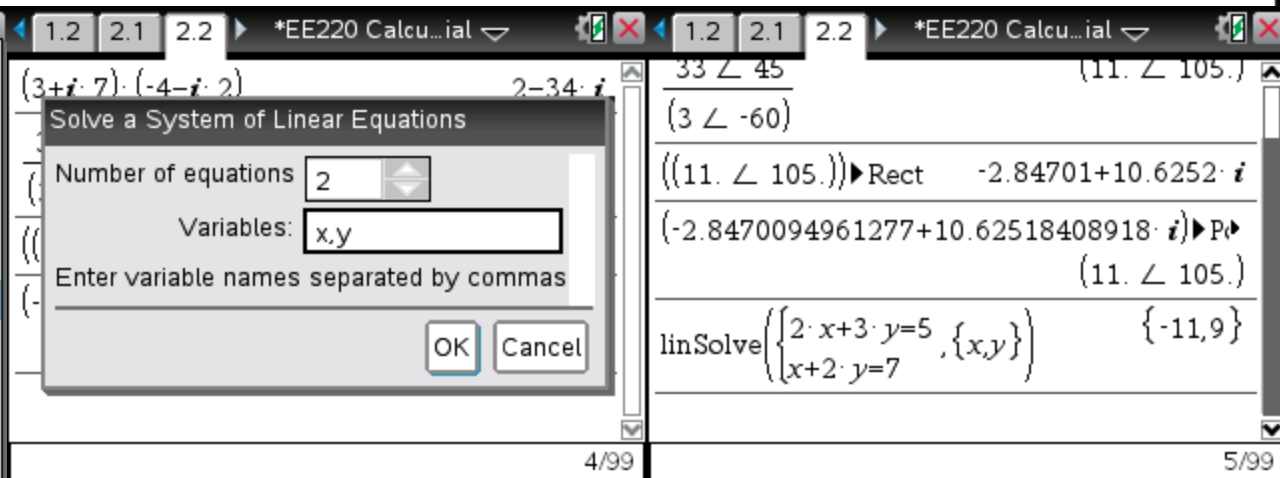
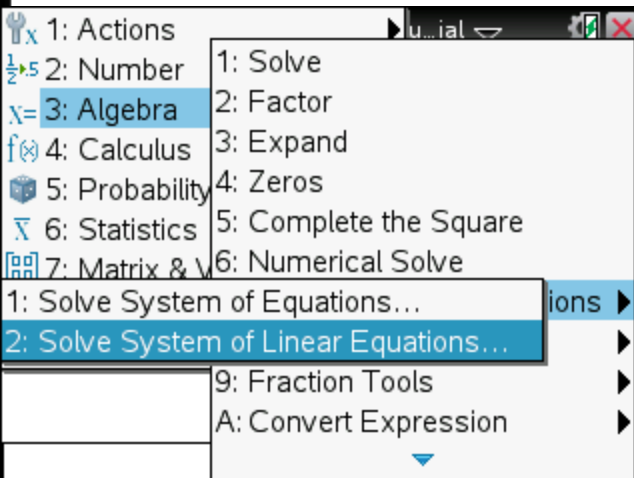
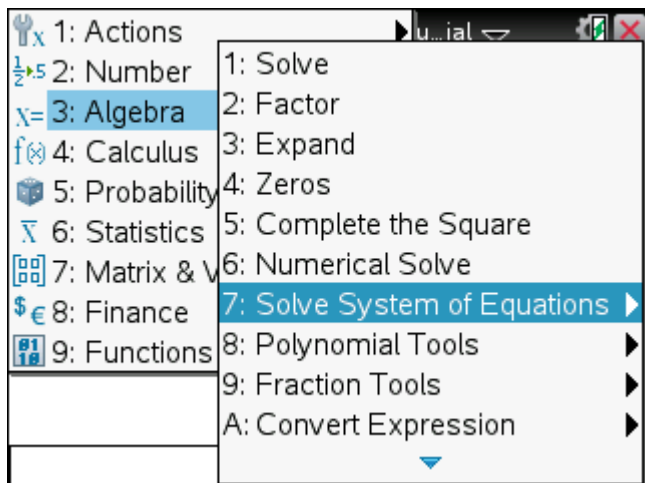
To convert complex number in rectangular format to polar format, press the  button, and then 1 to get to the first tab. Press 'p' and scroll down to ► Polar and press <enter>. Click <enter> to solve (<enter> alone may give a fractional answer for some problems; use <ctrl>+<enter> if necessary).



Solving Systems of Linear Equations


$$\begin{aligned} \text{a) } 2x + 3y &= 5 \\ x + 2y &= 7 \end{aligned}$$

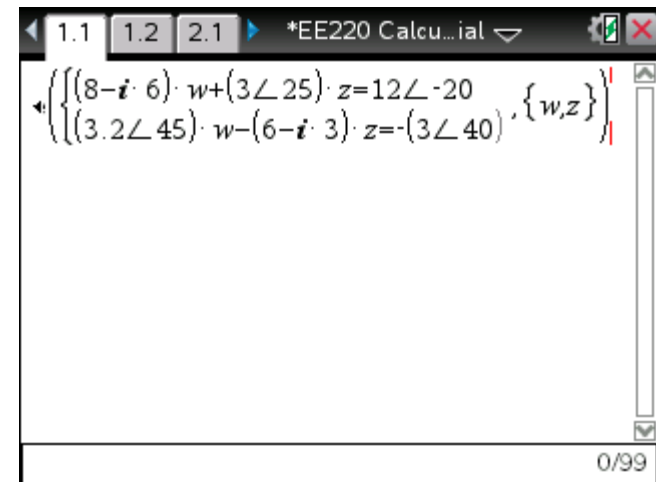
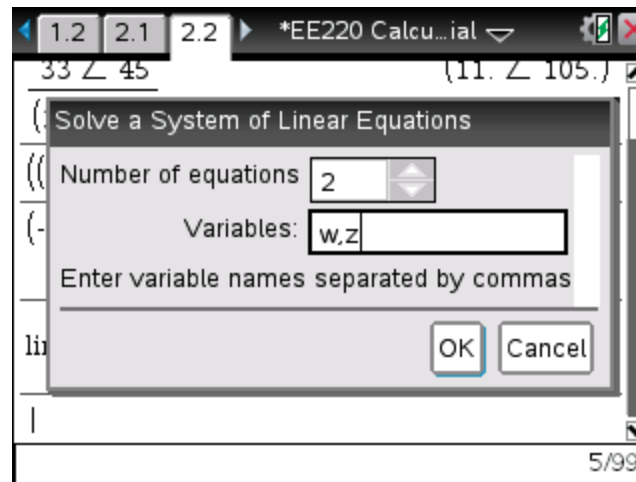
Put calculator back in real format (doc, 7, 2, ▼, ▼, ▼, ►, ▲, ▲, <enter>, <enter>). Then hit menu, 3, 7, 2. In the box that pops up, type 2 for the number of equations, press <tab>, type x,y and then hit <enter>. Type the equations in the empty boxes. Click <enter> to solve.




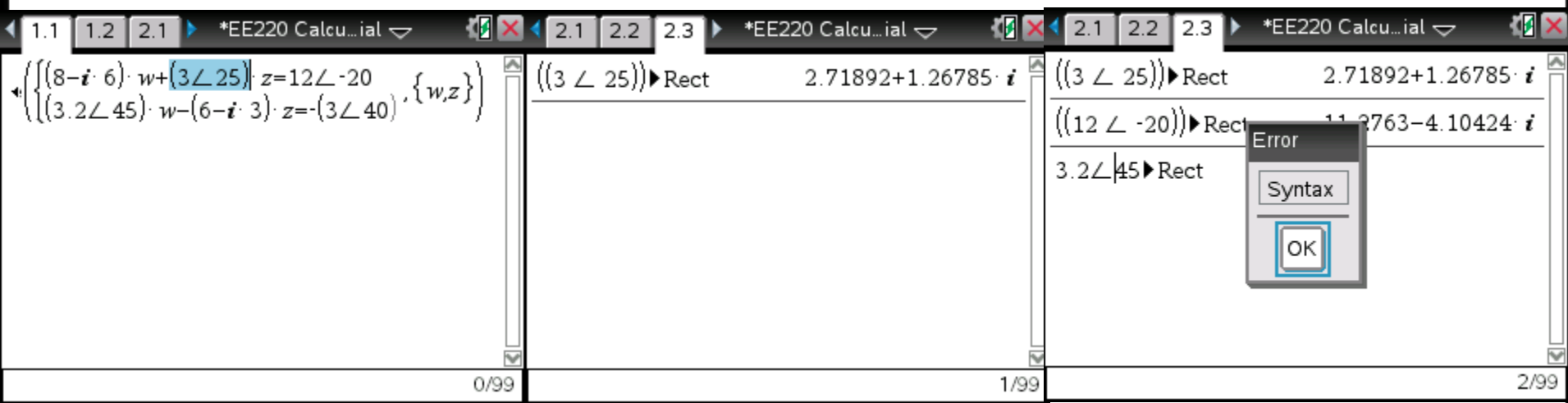
Solving Systems of Linear Equations w/ Complex Numbers

$$\begin{aligned} \text{b) } (8-j6) w + (3\angle 25^\circ) z &= 12\angle -20^\circ \\ (3.2\angle 45^\circ) w - (6-j3) z &= -(3\angle 40^\circ) \end{aligned}$$

Using this method, the calculator will not solve a system with a mix of rectangular and polar numbers. First, following steps on the previous slide, set up and input the problem (<menu>, 3, 7, 2, , 2, <tab>, , w,z, <enter>; enter equations, use <ctrl> +  to insert an \angle sign).



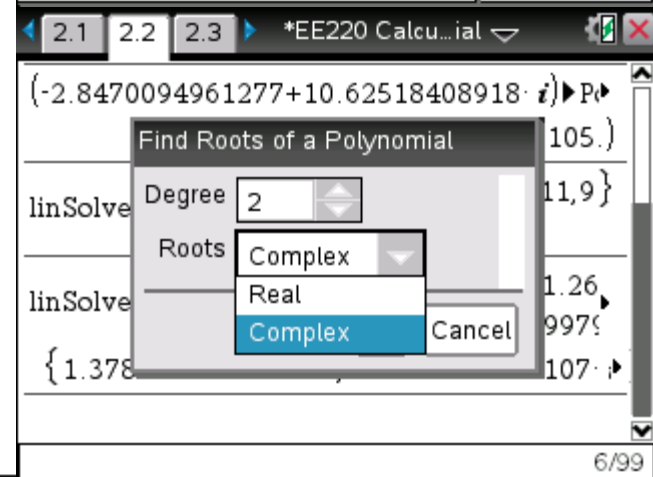
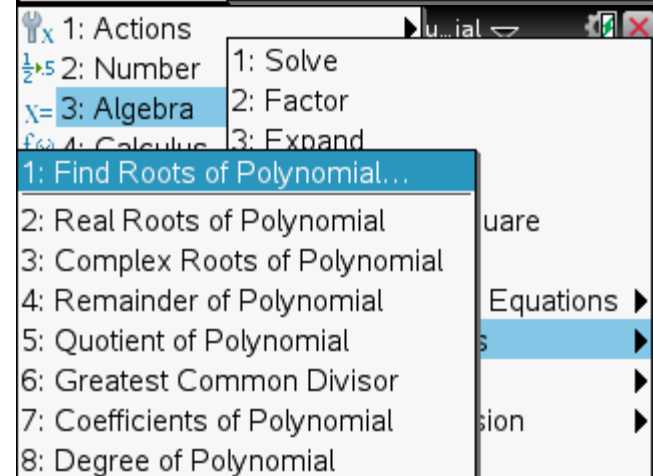
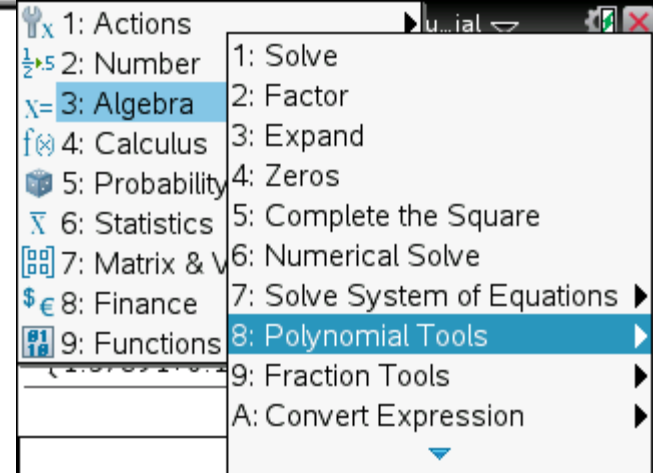
Now, the numbers in phasor format need to be converted to rectangular format. Use the arrow keys while holding down the <shift> key to highlight a phasor including the parentheses (a syntax error will result otherwise) and press <ctrl>+c to copy. Press <ctrl>+<doc> to add a new page, and click 1 to make it a calculator page. Press <ctrl>+v to paste and then convert to rectangular by pressing , 1, r, scroll to ►Rect, <enter>, <ctrl>+<enter>. Hit ▲ and then <ctrl>+c to copy the answer. (continued on next slide)



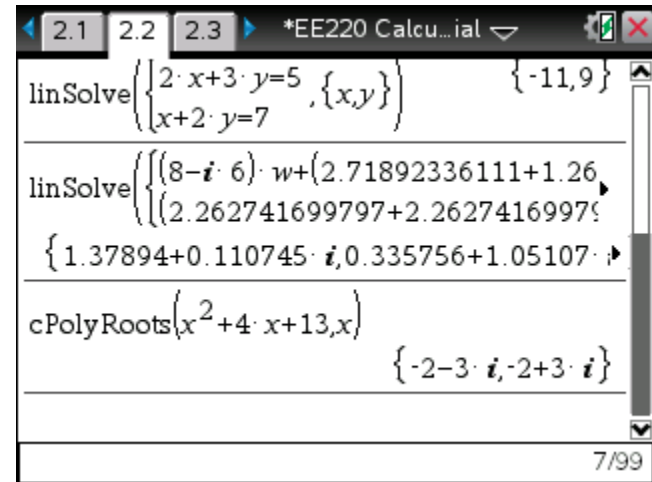
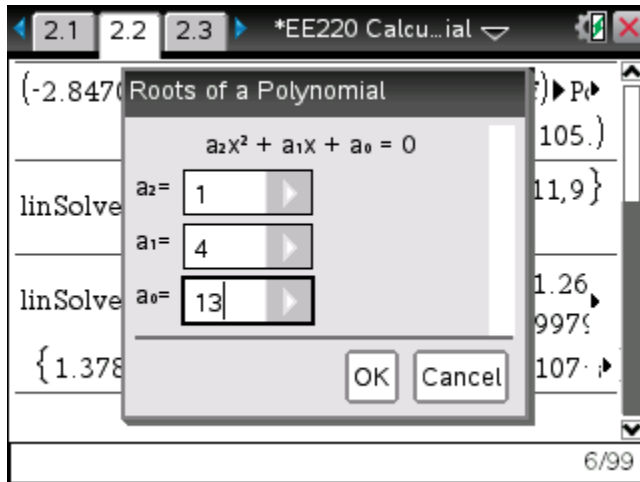
Finding the Roots of Polynomials

$$a) s^2 + 4s + 13 = 0$$

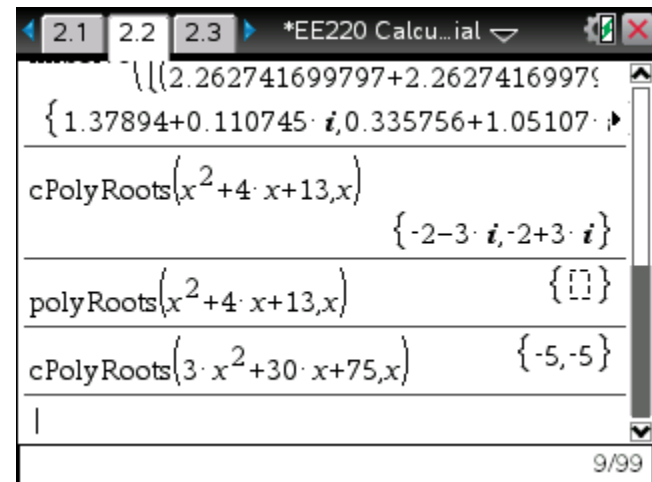
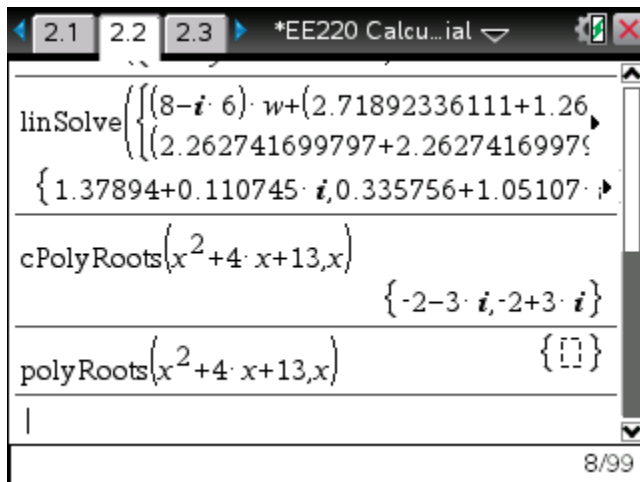
Click <menu>, 3, 8, and then 1. In the box that pops up, set Degree to 2, hit <tab>, ►, ▼, and <enter> twice to set the roots to Complex and accept. Always set the roots to Complex because that setting will work for both real and complex roots while the Real setting will only work for real roots (example on next slide).



In the box that pops up, set the values to the coefficients of the polynomial for this problem (1, 4, and 13), and press <enter> to solve.



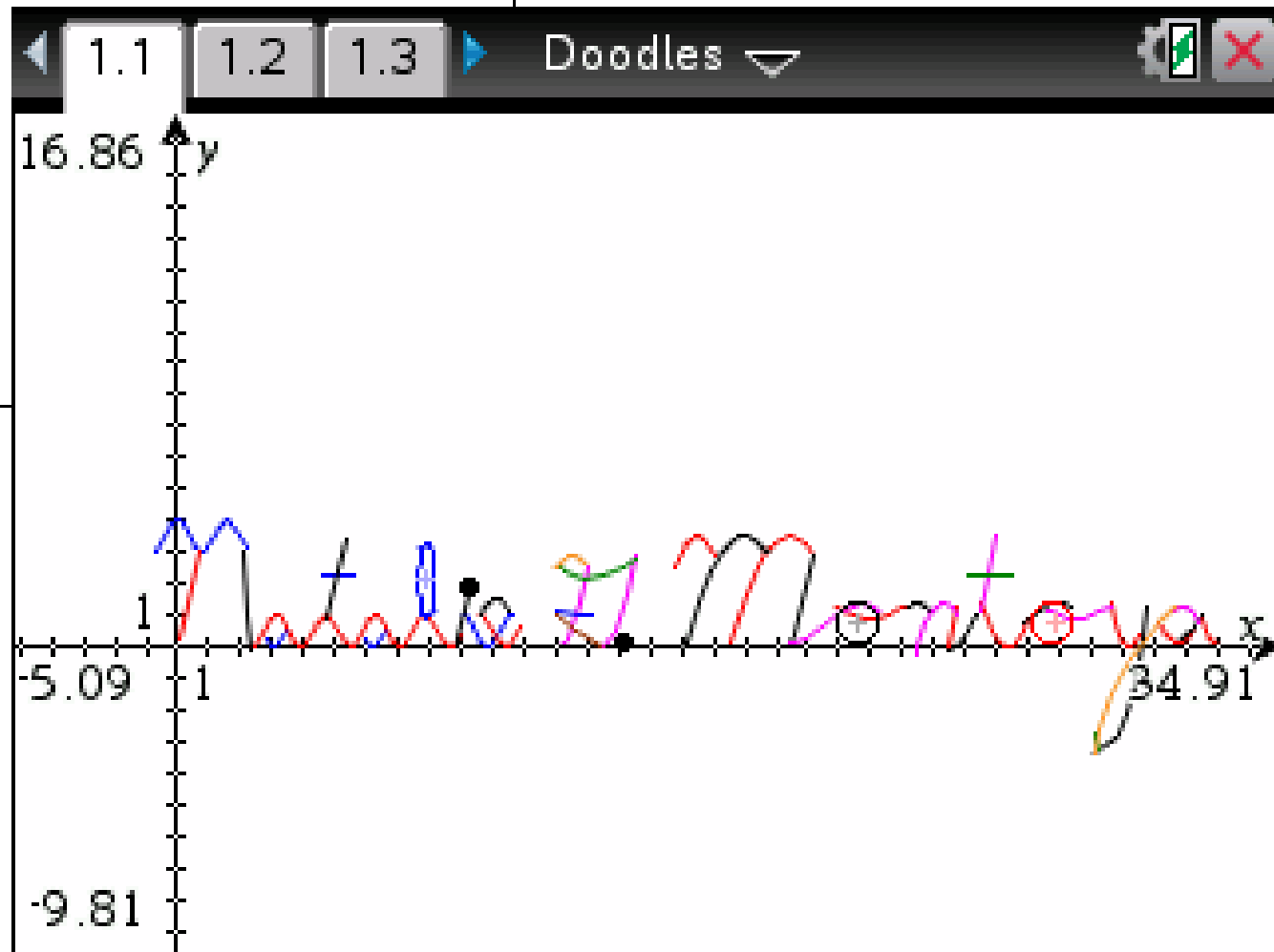
Were you to set the roots to Real, the result would be an empty box as seen on the bottom left. The Complex setting, however, will show real roots as well as seen on the bottom right.



2.2 2.3 2.4 *EE220 Calcul...ial

Congratulations! You now know how to use your TI-nspire calculator. Good luck in EE220.

Best wishes,
Natalie G. Montoya



[Actual Graph](#)

(links to functions, equations, and points used)