INTRODUCING THE TI-NSPIRE, SOLVING LINEAR EQUATIONS AND INEQUALITIES IN ONE VARIABLE

Materials

- TI-Nspire™ or TI-Nspire CAS™
- Solving_Linear_Equations.tns
- TI-Nspire™ software

Mathematical Concepts

Solving equations
- Intersection points
- Linear
- One variable equations vs. inequalities

Overview

Students who have had prior experience with any TI (handheld or computer) will learn to use TI-Nspire™ more easily than others. It is important that you master some basic skills in order to facilitate learning.

Classroom Setup

Students can work alone or in groups of two with one answering questions on paper and the other one using the calculator.

Introduction

The following activity introduces the new TI-Nspire by solving equations using graphing. This could be used as an introduction, but is truly a review of concepts in preparation for moving on to more advanced topics in algebra and interpreting function characteristics. Students will explore methods that help to solve one-variable equations/inequalities using visual representations.

Getting Started.

1. Open a new document by pressing ⌂ Home and selecting ⑤ New Documents, (See Figure 1).

2. Move to the next page using ⟨ctrl⟩ **NAVPad** ⟨✴⟩ right wheel. Read the lesson objectives.

Think First. Write each statement in a complete sentence.

3. If $y = 2x-4$ and $y = 4x +1$, then
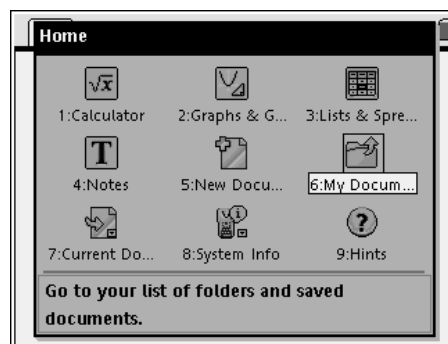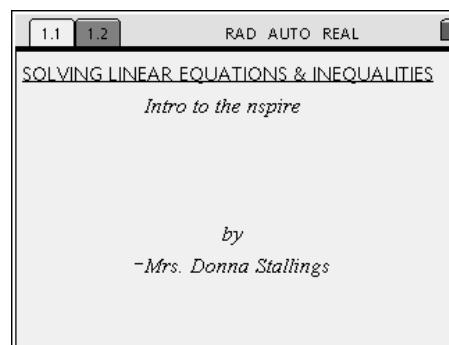
$2x-4 =$ _____

Figure 1

Figure 2

4. Create a new one-variable equation using substitution.

_____

5. Click ⌂ and then select ② Move your cursor, using the NAVPAD, to the equation line and insert y= 2x-4 for f1(x). Your line should appear in the window.

6. Click (menu) ⟨6⟩⟨3⟩ to find the point where the line intersects with the y-axis.

Use your NAVPAD to highlight the line

y=2x-4. Click enter and then highlight the y-axis, click enter.

7. A point should appear where the two lines meet. To find the exact coordinates, click (menu) ⟨1⟩⟨6⟩⟨clear⟩ Now move the cursor over the point and a shadow of the point should appear. Click enter twice. What is this point called? What are the coordinates?

7a. What is significant about all coordinates of x - intercepts?

Now, click (menu) ⟨2⟩ ⟨5⟩ to insert a function table. Use the function table to help you find the x-intercept.
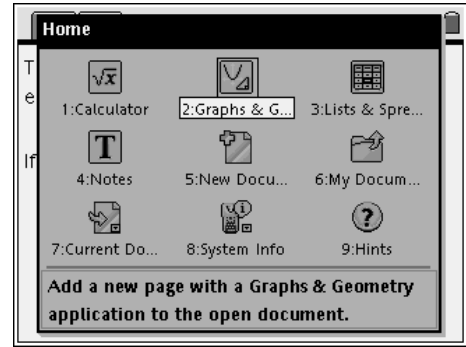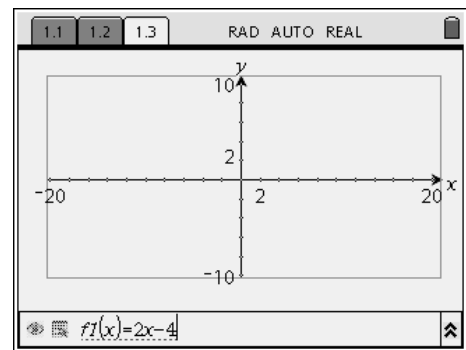
What are the coordinates of the x-intercept?
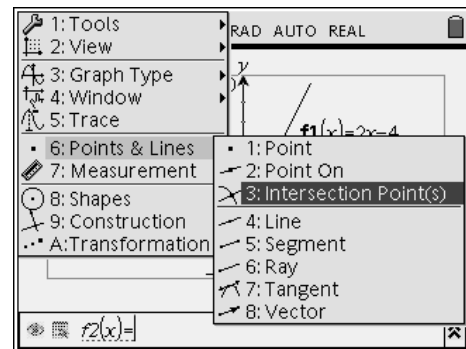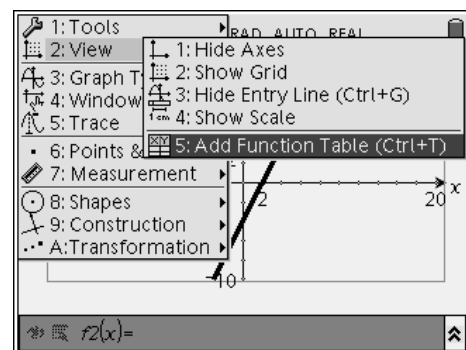

Figure 3

Figure 4

Figure 5

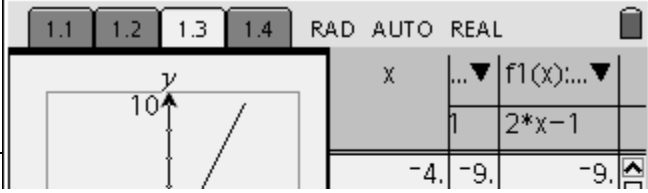**Figure 6**

Investigating Equation #2:

8. Click /e (Figure 7) until the graphing area is highlighted. Scroll down to f2(x) and hit (enter). Insert a new function f2(x) = 4x + 1. Your table should now include values for f2(x).

    Use the table to find the x and y intercepts of this equation.

    x-intercept: _____

    y-intercept:_____

Figure 7

9. To determine where the lines meet or where the expressions are equal, we must find a point on the coordinate plane where the value for x produces the same value for y for both equations. Use either the Points and Lines, Intersection steps (see Figure 5) or observe the table and find this unique point.

10. _____is the point of intersection because

    _____
    _____
    _____
    _____
    _____
    _____.

Problem #2

11. Given 2x -1 = 3x + 9, find the two functions that make up this one –variable equation.
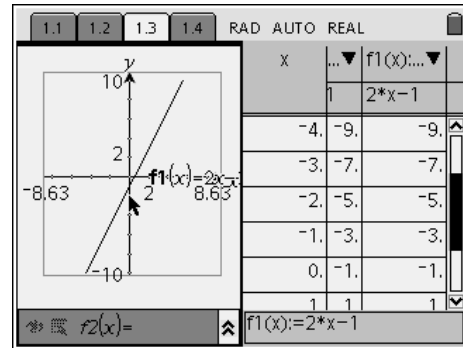
f1(x) =

f2(x) =

12. Insert a new coordinate plane, Click ⌂ and then select ②, and graph the two lines. Find the intercepts and the point of intersection or solution to the equation.

Functions	x-intercept	y-intercept	Solution
F1(x)			
F2(x)			

13. What is the difference between the point of intersection and the solution to the one-variable equation?

14. How are these two answers the same?

Problem # 3:

1. What would f1(x) and f2(x) be if

2x - 4 < 6?

F1(x) = _____

F2(x) =