

# INTRODUCING THE TI-NSPIRE, EXPLORING FUNCTIONS

## Materials

- TI-Nspire™ or TI-Nspire CAS™
- TI-Nspire™ software

## Mathematical Concepts

- Functions
- Functions vs. Relations
- Function Notation
- Graphing Functions
- Domain vs. Range

## Overview

This activity is for anyone who knows the basic functions of the TI-Nspire™. Students will explore functions using graphs and function tables.

## Classroom Setup

Students can work alone or in groups although it is important for the teacher to set aside time for full class discussion.

## Introduction

This activity is geared for students who have had a lesson on functions. Basic function knowledge about the nspire is assumed. Students explore the new nspire as they explore functions and identify domain & range.

## Getting Started.

1. Open the file (See Figure 1)

**Exploring\_Functions.tns** Read the lesson introduction.

**Think First. Write each statement in a complete sentence.**

2. What does the domain of a function represent?
3. What does the range of a function represent?
4. Observe the table on page 1.3. Describe how you can determine whether this is a function simply by observing the table?

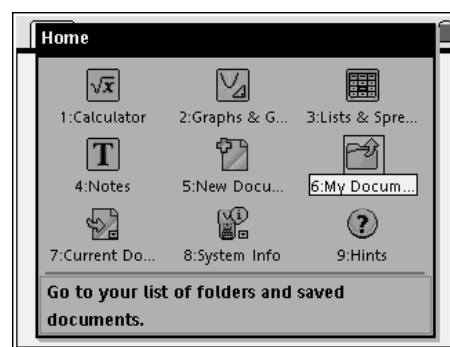


Figure 1

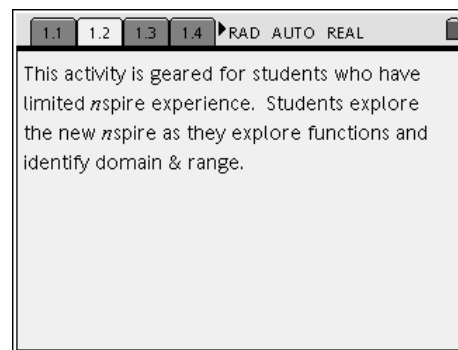



Figure 2

5. The table on page 1.3 represents time spent studying for one week for a math exam, find the domain? Range?
6. What type of function would fit the pattern shown in the table? (linear, quadratic, cubic, etc.)
7. Insert a data and statistics page and graph a scatter plot using day and time variables. Use the  actions keystrokes to find the regression equation. Which type of regression best fits the provided points?

### PROBLEM #2

Given the function  $f1(x) = 10x + 50$ , where "x" represents the number of items produced and  $f1(x)$  represents the Total Cost of Production:

USE THE TABLE (Page 2.2):

1. Find the Domain and Range.
2. Does  $f1(x)$  represent a function?
3. What does  $f1(0)$  represent with respect to this problem?
4. How can you find the intercepts using the function table?
5. What is the y-intercept? \_\_\_\_\_  
x-intercept? \_\_\_\_\_

	A day	B time
1	1	0
2	2	1/5
3	3	1/4
4	4	1/3
5	5	1/2

Figure 3

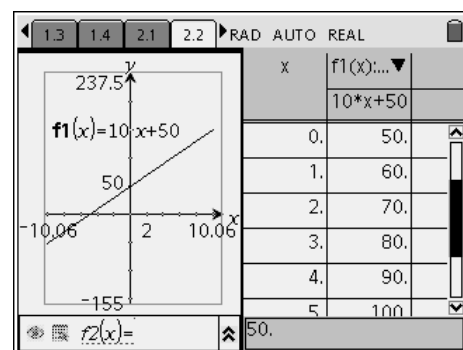


Figure 4

4. Use problem #2, answer these questions after observing the graph.

- What are the intercepts?
- Is this a function?
- What is the domain? Range?
- Find  $f(0)$ .

5. Did your responses change? Why or Why not?

### Problem #3:

Discuss with your partner. Give a detailed explanation about how to determine whether an equation is a function.

Should you use the graph or a table to determine whether problem #2 is a function?

a. When using the Vertical Line Test, you must observe the \_\_\_\_\_ (graph, equation, table).

b. When observing the list of ordered pairs, you can tell the relationship is a function by \_\_\_\_\_.

c. Considering the given relationship,  $f1(x) = 10x + 50$ , how do you know this is a function, just by looking at the equation?

### Picture #1:

Given  $g(x)$ ; create a table of values and find  $g(1.5)$ .

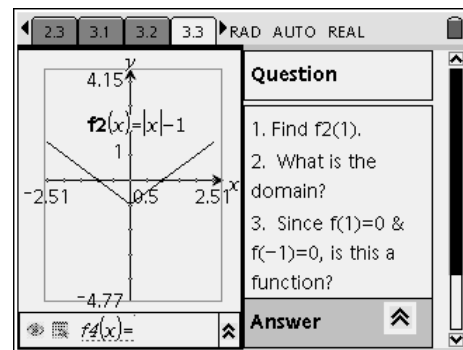
X	1.5			
$g(x)$				

If  $g(x)$  represents the formula for the area of a circle,

1. What is the domain?
2. What does 1.5 represent in the notation  $g(1.5)$ ?

**Picture #2:**

1. Find  $f_2(1)$ .
2. What is the domain?
3. There are two "x" values where the range is zero. Is  $f_2(x)$  a function?



4. Find the domain.

**Picture #3:**

1. What is the range?
2. Is  $f_3(x)$  a function?
3. Is this function one where the vertical line test would be easiest to use to determine whether it is a function or not?

**Picture #4:**

1. Is this a Function?
2. Find the point(s) where the figure intersects with the y axis.

**EXTENSION:** Create an equation that is a function, but when rotated  $90^\circ$  in any direction becomes a graph of a relation that is not a function.