# INTRODUCING THE TI-NSPIRE, SUPPLY AND DEMAND

| **Materials** | **Overview** |
| --- | --- |
| • TI-Nspire™ or TI-Nspire CAS™<br>• TI-Nspire™ software | Students will use a collection of information gathered by a store owner to develop linear functions using linear regression tool.  Students will graph and explore how price affects supply and demand. |

**Mathematical Concepts**

Functions
* Functions
* Function Notation
* Graphing Functions
* Linear Regression
* Supply and Demand

**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 Ol' Odd Baby Incorporated Store is coming out with a new toy.  Josie Keys is the Marketing Director.  Her problem is to decide which selling price will best suit the needs of Ol' Odd BABY Incorporated customers and store managers.  Data has been collected from previous similar promotions to help her make a decision.**

Getting Started.

1.  Begin a new file by pressing (⌂) Home and selecting (6) New Documents, (See Figure 1).

2.  Open a Spreadsheet Page and using table 1, insert the information for **price** in column A.

3.  Insert information for **supply** in column B.

4.  Find the supply function using the linear regression tool. (MENU, STATS, STATS CALC, Linear Regression: mx+b)

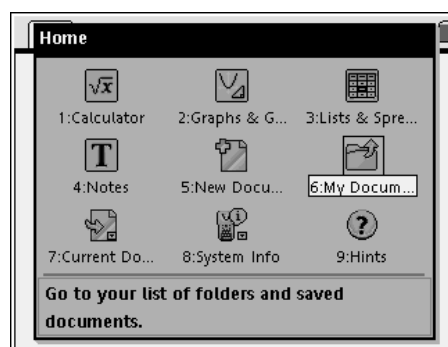5.  Write the supply function in terms of price in slope intercept form.

S(p) = _____



**Figure 1**

| Selling Price of Each Doll | Number Supplied per Week per store | Number Requested per week per store |
| --- | --- | --- |
| $1.00 | 37 | 535 |
| $2.00 | 124 | 395 |
| $3.50 | 254.50 | 185 |

**Table 2**

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

6.  How is supply affected as the price increases?

7.  What do the coordinates (2, 124) mean with respect to this situation?

8.  How is demand affected by price?

**Figure 3**

9.  Open a second spreadsheet page.  Insert the titles and information for price in Column A.  Insert the information from your handout for Demand in Column B.  Find the equation of the line using the linear regression tool. (MENU, STATS, STATS CALC, Linear Regression)

10. Write the Demand Function in slope intercept form:

D(p) = _____

**PROBLEM #2**

Open a Graphs and Geometry page.  Insert the two functions for supply and demand.  Sketch a picture to the right above the "figure 3" caption.

f1(x) = S(p) = _____

f2(x) = D(p) = _____

1.  What is the meaning of "S(p)"?

2.  What is the meaning of "D(p)" ?

3.  What is the meaning of the slope of the supply function? Demand function?

4.  Since both equations are functions, will there ever be a point where one input has two different outputs?

5.  What is the meaning of the y-intercept of the demand function?

Making sense of the graphs and tables:

► 1. If Keys sets the price at $2.50 per doll, how many can be supplied?

► 2. If Mrs. Keys sets the price at $2.50 how many disappointed customers will each store have during the week?

► 3. If Keys sets the price at $3.80 per doll, estimate how many will be in demand.

► 4. If Mrs. Keys sets the price at $3.80 per doll, how many unsold dolls will remain at each store at the end of a week?

► 5. According to this graph, if the company could give the dolls away, how many would each store need per week?

► 6. What does the solution to the system mean with respect to this problem?

► 7. Why is there only one solution to this system?

► 8. What does the equilibrium point tell Ms. Keys about her new product?

► 9. The store owner asks Mrs. Keys what the price should be based on her investigation. What do you think she should suggest? Why?