



Unit 7: Linear function word problems
Lesson 04 Calculator tables

In the process of solving a word problem it is often useful to make a chart of a few specific instances of the independent and dependent variables. Typically, a **pattern** will be noticed from which the function can be written.

Example 1: Answer the following questions from this scenario:

Farmer Jones sells his prize winning apples in a special decorative box. He charges \$1.50 for the box plus 42 cents for each apple. Write a function that expresses the total cost for any given number of apples purchased.

Choose an independent variable. What is its meaning? *x , number of apples*

Choose a dependent variable. What is its meaning? *$y = f(x)$, total cost*

Make a chart for the two variables and compute the cost for 1, 2, 3, and 4 apples.

<i>x, apples</i>	<i>$y = f(x)$, total cost</i>
<i>1</i>	<i>$y = (.42)1 + 1.50 = 1.92$</i>
<i>2</i>	<i>$y = (.42)2 + 1.50 = 2.34$</i>
<i>3</i>	<i>$y = (.42)3 + 1.50 = 2.76$</i>
<i>4</i>	<i>$y = (.42)4 + 1.50 = 3.18$</i>

Write out the linear function: *$y = f(x) = .42x + 1.50$*

What is the slope and what does it represent? *.42, the cost of one apple.*

What is the y-intercept and what does it represent? *1.50, the cost of the box*

What would be the total cost of 8 apples? *$f(8) = (.42)8 + 1.50 = \$4.86$*

What would be the new function if the price of the box increased to \$2.00 and the price of each apple went up to 51 cents? *$y = f(x) = .51x + 2.00$*

The chart of Example 1 can easily be created on a graphing calculator. On the calculator it is not called a chart, rather a **table**.

See **Calculator Appendix G** (and an associated video) for how to set-up a table and for how to actually produce the table for a given function.

Example 2: Create the table of example 1 on a graphing calculator. Write out the table settings as well as the table itself.

Plot1	Plot2	Plot3
Y1=	.42X+1.5	
Y2=		
Y3=		
Y4=		
Y5=		
Y6=		
Y7=		

TABLE SETUP		
TblStart=	1	
ΔTbl=	1	
Indent:	Auto	Ask
Depend:	Auto	Ask

X	Y1	
1	1.92	
2	2.34	
3	2.76	
4	3.18	
5	3.6	
6	4.02	
7	4.44	

X=1

Assignment:

1. Billy Bob Matherstein gets into a lot of trouble in his Alg I class. In fact, he now has 132 minutes of detention assigned. Miss Informed, his math teacher, has made a deal with Billy Bob. For every problem he gets right on the next test, she will deduct 5 minutes of detention. Write a function that expresses the amount of detention he has in terms of the number of problems he gets right.

Choose an independent variable. What is its meaning?

Choose a dependent variable. What is its meaning?

Make a chart for the two variables and compute the number of minutes for 1, 2, 3, and 4 correct problems.

Write out the linear function indicated by this table:

What is the slope and what does it represent?

What is the y-intercept and what does it represent?

What would be his detention time if he gets 6 problems right?

What would be the new function if he initially had 200 min of detention but gets rewarded with 10 min off for each correct problem?

2. Mr. Appleton grows apples (what else?) and hires teenagers in the summer to harvest his apples. Each person receives \$10 just for showing up for work plus 8 cents for each apple he or she picks. Write a function that expresses the amount of money a person earns in terms of the number of apples picked.

Choose an independent variable. What is its meaning?

Choose a dependent variable. What is its meaning?

Make a chart for the two variables and compute the money earned by a person picking 30, 50, 70, and 90 apples.

Write out the linear function indicated by this table:

What is the slope and what does it represent?

What is the y-intercept and what does it represent?

What would be the pay if a person picks 300 apples?

What would be the new function if only \$5 is paid for showing up but the price is now 10 cents per apple?

3. Produce the chart of problem 1 on a graphing calculator and show the table set-up here as well as the table.

4. Produce the chart of problem 2 on a graphing calculator and show the table set-up here as well as the table.