

Day 4

Lesson 1-4

Patterns and Functions

Lesson Objectives Write a function rule Understand relationships of quantities in a function	NAEP 2005 Strand: Algebra Topic: Patterns, Relations, and Functions Local Standards: _____
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Vocabulary

is a relationship that assigns exactly 1 output for each input.

A function _____

A function rule such as $y = 2x + 3$, is an eq. that describes the relationship

The value of the dependent variable depends on the value of the independent variable.

The possible values for the input, or independent variable, of a function are the domain of the function. The possible values of the output, or the dependent variable, are the range of the function.

x	y
1	12
2	24
3	36

Example

Writing a Function Rule Suppose you are making batches of muffins for a bake sale. The relationship between the number of batches (input) and the number of muffins (output) is a function. Use the table to write a function rule.

x	Number of Batches	1	2	3	4
	Number of Muffins	12	24	36	48

← independent
← dependent

Relate Total number of muffins is dependent of the # of batches made

Define Let $n =$ ← The number of batches is the input.

Let $m =$ ← The total number of muffins is the output.

Write $m = 12n$

The function rule is $m = 2n$

Function = Equation
Rule
dependent variable =

Quick Check

1. Write a function rule for the relationship between the number of hours (input) and the number of miles (output).

h	Hours	0	1	2	3	4
m	Total Miles	0	60	120	180	240

\downarrow \downarrow \downarrow \downarrow
 60 60 60

$m = 60h$

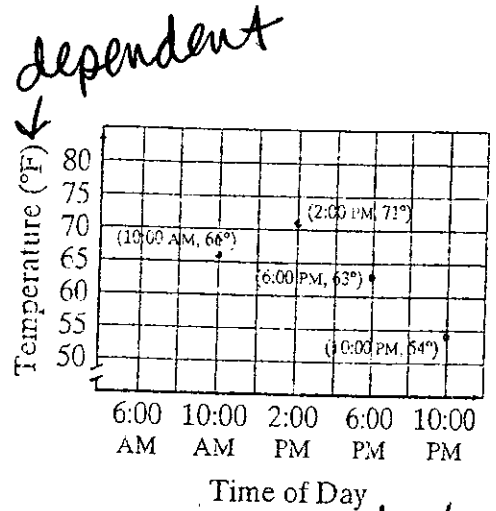
Graphing Calc $y = 60x$

Example

2 Identifying Independent and Dependent Quantities

The table and graph model a function relating time of day and temperature. Identify the independent and dependent quantities.

Time of Day	Temperature (°F)
10:00 AM	66
2:00 PM	71
6:00 PM	63
10:00 PM	54



The temperature is the dependent quantity because it depends on the time of day.
Time of day is the independent quantity.

Quick Check

2. The cooking time for an unstuffed turkey is about 20 minutes per pound.
 What are the independent quantity and dependent quantity for this situation?

x independent: pounds the turkey weighs
 y dependent: cooking time

$$y = 20x$$

x	y
0	0
1	20
2	40
3	60

Example

- 3 Reasonable Domain and Range Mateen has 3 hours a night for homework and fun. He never has more than 2 hours of homework each night.

a. Identify the independent and dependent quantities for this situation. The amount of time for Fun depends on the amount of time for HW.
 So the amount of time for fun is the dependent variable. The amount of time for homework is the independent variable.

b. Find reasonable domain and range values for this situation. A reasonable domain is from 0 to 2 hours. If Mateen has no homework, he has 3 hrs for fun. If he has 1 hr of homework, he has 2 hrs for fun.

HW	Fun
0	3
1	2
2	1

Quick Check

3. Charlie downloads songs for \$.75 each. He has between \$3.00 and \$6.00 to spend on songs. Identify the independent and dependent quantities for this situation and find reasonable domain and range values.

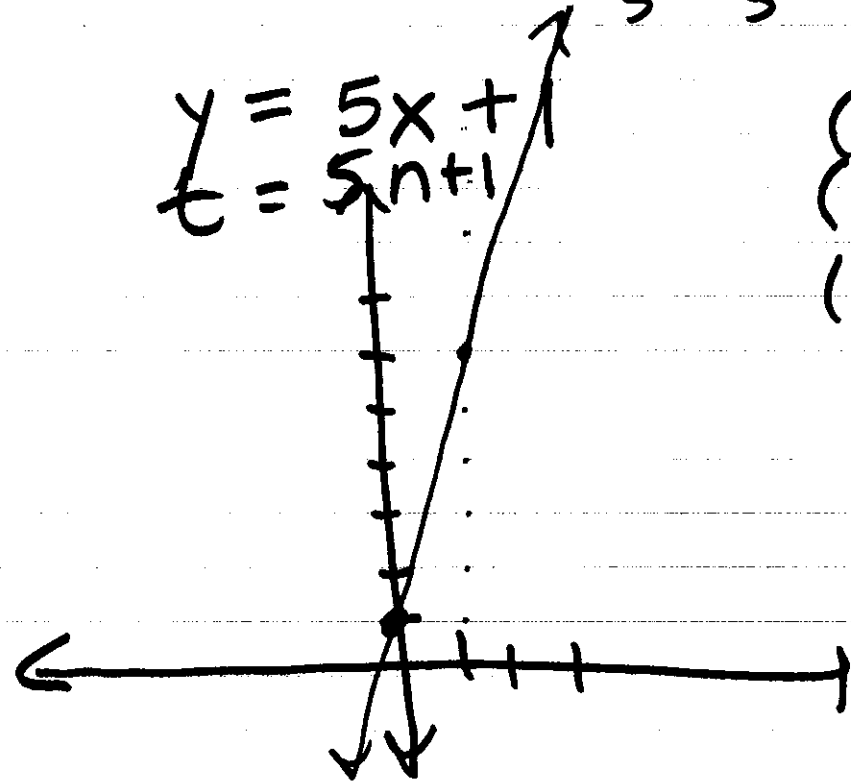
x independent: money spends
 y dependent: # of songs downloading

ex 2

x	# OF houses	0	1	2	3	4
y	total # toothpicks		6	11	16	21

$$y = 5x + 1$$
$$t = 5n + 1$$

- (0, 1)
- (1, 6)
- (2, 11)



ex

n	x	0	1	2	3	4
t	y	2	5	8	11	14

$$y = 3x + 2$$
$$t = 3n + 2$$

x
money

y
OF songs

\$3
\$3.75
\$4.50
\$5.25
\$6

4
5
6
7
8

domain:

between \$3 + \$6

Range:

between 4 + 8 songs