

**Indicator 26 Class Notes by Mrs. Joshi**  
**Dependent and Independent Variables**  
**(AL Standard 21, 21a)**

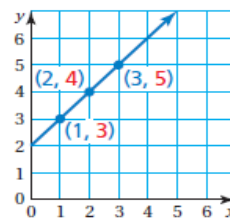
I can identify independent & dependent variables from word problems.  
 I can determine if an ordered pair is a solution to a two variable equation.

**Key Idea**

**Graph of a Function**

A function can be represented by a **graph**. The graph below is for the function  $y = x + 2$ .

Input, $x$	Output, $y$	Ordered Pair, $(x, y)$
1	3	(1, 3)
2	4	(2, 4)
3	5	(3, 5)



When you draw a line through the points, you graph *all* of the solutions of  $y = x + 2$ .

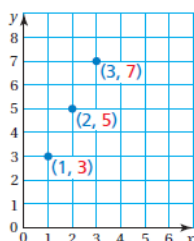
**EXAMPLE 1 Graphing a Function**

Graph  $y = 2x + 1$ .

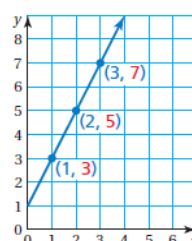
Make an input-output table. Use the values 1, 2, and 3 for  $x$ .

$x$	$y = 2x + 1$	$y$	$(x, y)$
1	$y = 2(1) + 1$	3	(1, 3)
2	$y = 2(2) + 1$	5	(2, 5)
3	$y = 2(3) + 1$	7	(3, 7)

Plot the ordered pairs.



Draw a line through the points.



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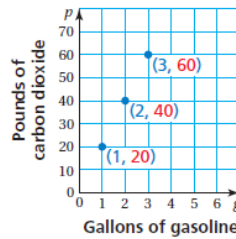
### EXAMPLE 2 Graphing a Function

Use the function  $p = 20g$  to find the number of pounds  $p$  of carbon dioxide produced by burning  $g$  gallons of gasoline. Graph the function. Make an input-output table.

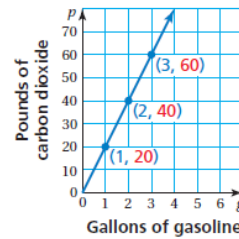


Input, $g$	$p = 20g$	Output, $p$	Ordered Pair, $(g, p)$
1	$p = 20(1)$	20	(1, 20)
2	$p = 20(2)$	40	(2, 40)
3	$p = 20(3)$	60	(3, 60)

Plot the ordered pairs.



Draw a line through the points.



#### Reading

Because you cannot have a negative number of gallons, use only positive values of  $g$ .

### Summary

#### Representing a Function

There are several ways to represent a function.

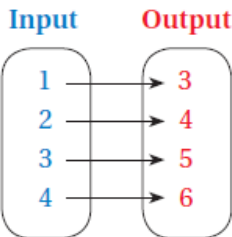
**Words** Each output is 2 more than the input.

**Equation**  $y = x + 2$

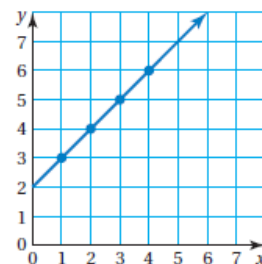
#### Input-Output Table

Input, $x$	Output, $y$
1	3
2	4
3	5
4	6

#### Mapping Diagram



#### Graph





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### Dependent and Independent Variable

There are two **variables**. One is called the **independent variable** (*often represented by  $x$* ) and the other is called the **dependent variable** (*often represented by  $y$* ). The **variable** whose value does not depend on the other **variable** is the **independent variable** (*often represented by  $x$* ). The **variable** (*often represented by  $y$* ) whose value depends on the other **variable** is the **dependent variable**.

2)

Independent + Dependent Variables

- \* Dependent variables are always graphed on the  $y$ -axis.
- \* Independent variables are always graphed on the  $x$ -axis.
- \* A dependent variable DEPENDS on an independent variable.

DEPENDENT	INDEPENDENT
Amount of paycheck	Number of Hours Worked
Price of Speeding Ticket	Speed you were traveling
Height of Grass	Amount of Rainfall
Speed of Car	Pressure applied to gas pedal
Grade in Algebra 1	Effort in Class

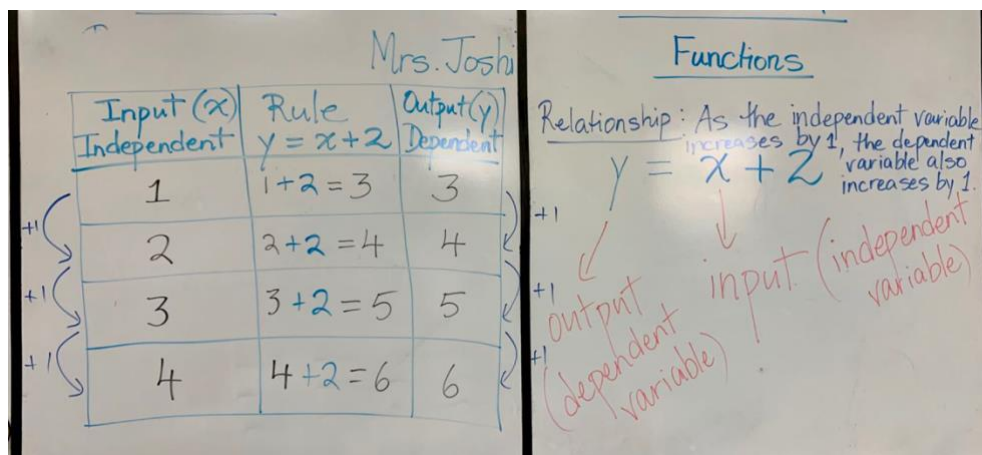


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What is an example of a dependent variable in math?

The "output" value of a function.  
(It is called **dependent** because its value depends on what you put into the function.) **Example:**  $y = x^2$ .

- $x$  is an **Independent Variable**.
- $y$  is the **Dependent Variable**.



Input (x) Independent	Rule $y = x + 2$	Output (y) Dependent
1	$1 + 2 = 3$	3
2	$2 + 2 = 4$	4
3	$3 + 2 = 5$	5
4	$4 + 2 = 6$	6

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Functions

Relationship: As the independent variable increases by 1, the dependent variable also increases by 1.

$y = x + 2$

input (independent variable)

output (dependent variable)