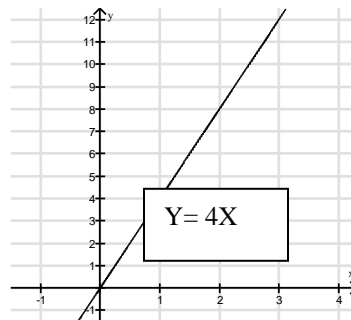


**Introduction of Functions in 0031**  
**Topics to Cover in Section 3.6**

- Discuss the notion of dependence: For Ex: An outcome of an election is dependent upon the economy of the nation; the amount of sales in a car dealership is dependent on the weather outside.
- Define a function: A **function** is a correspondence between an input variable and an output variable that assigns a single, unique output value to each input value
- Vocabulary words such as **function, input, output, independent variable, dependent variable, function notation, domain** and **range** must be understood. This is also a good time to review (or introduce to some students) interval notation and some set notation.
- Discuss the concept of function, using examples such as:
  - (1) the perimeter of a square is a function of the length of the side;
  - (2) the distance traveled at a constant speed is a function of time;
  - (3) the amount of sales tax paid is a function of total amount spent;
  - (4) the cost of a taxi ride is a function of the number of miles traveled, etc. Emphasize that the output is a function of the input.
- Using one of the above examples, present examples of functions using the **four possible methods (often called the ‘Rule of Four’**: verbal, numerical (through tables), graphical, and symbolical. For the verbal description “The perimeter of a square is a function of the length of the side”. Symbolically  $p = f(s) = 4s$ . Numerically

$s$	$p = 4s$
0	0
1	4
2	8
3	12

and graphically



- Students should be able to identify whether a given table or set of ordered pairs could represent a function. For example consider the following tables which give values of  $X$  and  $Y$ .

$X$	-1	0	8	-2	5	12
$Y$	4	3	-1	0	3	-2

$X$	-2	-1	0	-2	3	5
$Y$	3	0	2	-1	-4	-2

- Which of the above could represent a function? Why or why not?

Given the following table

$M$	-1	5	8	-2	5	12	3
$P$	4	3	-1	0	10	-2	4

- Is  $P$  a function of  $M$ ? Why or why not?
- Is  $M$  a function of  $P$ ? Why or why not?
- Using function notation, students should be able to evaluate functions from tables, symbolically and graphically. Discuss practical domain and practical range
- Lead a class discussion on why the vertical line test works to show that a graph is or is not a function. Then show students how to find the domain and range from a graph.