Mini-Lecture 2.2

An Introduction to Functions

Learning Objectives:

- 1. Determine whether a relation expressed as a map or ordered pairs represents a function.
- 2. Determine whether a relation expressed as an equation represents a function.
- 3. Determine whether a relation expressed as a graph represents a function.
- 4. Find the value of a function.
- 5. Graph a function.
- 6. Work with applications of functions.

Preparing for an Introduction to Functions:



DEFINITION

A **function** is a relation in which each element in the domain (the inputs) of the relation corresponds to exactly one element in the range (the outputs) of the relation.

Examples:

1. Determine whether each relation represents a function. State the domain and the range of each relation.





VERTICAL LINE TEST

(4, 11)

A set of points in the *xy*-plane is the graph of a function if and only if every vertical line intersects the graph in at most one point.

3. Determine whether the graph is that of a function.





4. Find the following values for the function: $f(x) = \frac{x^2}{2} + 3 \longrightarrow y = \frac{x^2}{2} + 3$



b)
$$f(-x) = \frac{(-x)^2}{2} + 3 = \frac{x^2}{2} + 3$$

 $f(-x) = \frac{x^2}{2} + 3$

d)
$$f(x+4) = (\frac{\chi+4}{2})^2 + 3$$

M-13

