Chapter 2, Section 1 - Functions

SHOPPING CENTERS The number of shopping centers in the United States has grown in recent years, as shown in the following table. Use this information to predict the number of shopping centers in 1990, in 2002.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>7,600</td>
</tr>
<tr>
<td>1972</td>
<td>13,174</td>
</tr>
<tr>
<td>1976</td>
<td>17,523</td>
</tr>
<tr>
<td>1980</td>
<td>22,050</td>
</tr>
<tr>
<td>1984</td>
<td>22,508</td>
</tr>
<tr>
<td>1988</td>
<td>32,563</td>
</tr>
<tr>
<td>1992</td>
<td>38,966</td>
</tr>
<tr>
<td>1996</td>
<td>42,130</td>
</tr>
</tbody>
</table>


1. Definition of a Function
A function is a special type of correspondence.

Set of all people in the US	All nine-digit numbers with SS Numbers

This set is called the _______ This set is called the _______

Correspondence: ________________

Function or not?

Example: Set of all people in your family All numbers $\geq 0$

Domain

Range

Correspondence $\Rightarrow$ him/her to his/her weight

Function or not?

Example: Set of all people in your family All credit cards

Domain

Range

Correspondence $\Rightarrow$ him/her to his/her card(s)

Function or not?

Example: $(1,2), (3,4), (5,2)$

Domain $\Rightarrow$ __________ Range $\Rightarrow$ __________
Example: Which of the following graphs represent functions?

a)  

b)  

c)  

How can you tell?

II. Functional Notation

Let $y = 2x + 3$. Is $y$ a function of $x$?

We'll use $f(x)$ notation instead of $y$. $f(x)$ is read “$f$ of $x$” and does NOT indicate multiplication.

$s(x) = 2x + 3$

$g(x)$ dependent variable

$\frac{1}{5}$

II. Excluding Numbers from the Domain

Let $f(x) = \frac{2}{x-1}$. Can you find $f(0)$?

Can you find $f(0)$?

$\frac{2}{0-1} = \frac{2}{-1} = -2$

$f(2)$?

$\frac{2}{2-1} = \frac{2}{1} = 2$

$f(3)$?

$\frac{2}{3-1} = \frac{2}{2} = 1$

Domain $f = \{x \mid x \neq 1\}$
IV. Using Functional Notation on Graphs

a) $f(1) = 2$

b) any x-values for which $f(x) = 2$ are $-3, 1$