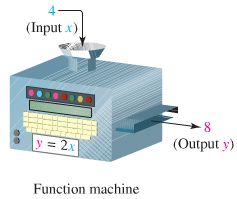
***Section* 1.2 − Functions**

***Relations***

A ***relation*** is any set of ordered pairs. The set of all first components of ordered pairs is called the domain of the relation and the set of second components is called the range of the relation.



**Definition of a Function**

A ***function*** is a relation between two variables such that to matches each element of a first set (called ***domain***) to an element of a second set (called ***range***) in such way that no element in the first set is assigned to two different elements in the second set.

The ***domain*** of the function is the set of all values of the independent variable for which the function is defined.

The ***range*** of the function is the set of all values taken on by the dependent variable.

***Example***

Determine whether each relation is a function and *find the domain and the range*.

***a***) 

Function: Yes

Domain: 

Range: 

***b***) 

Function: No

Domain: {1, 2}

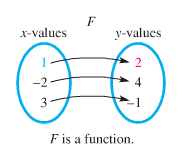
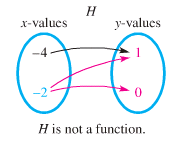
Range: {1, 2, 3}

***c***) 

Function: No

Domain: 

Range: {0, 1}

***Example***

Give the domain and range of each relation

|  |  |
| --- | --- |
|  | ***Domain***: {-1, 0, 1, 4}  ***Range***: {-3, -1, 1, 2} |
|  | ***Domain***:  ***Range***: |

**Functions as Equations** 

*x*: independent

*y*: depend on *x*

***Notation for Functions***

 read “ *f* of *x* ” or “ *f* at *x* ” represents the value of the function at the number *x*.

***Example***

Let 

1. 









1. 





***Example***

If , evaluate each of the following:

1. 
2. 

***Solution***

1. 





= 25 + 10 + 7



1. 









***Example***

Let , find 

***Solution***









***Example***

Given: , find the following.

1. 
2. 
3. 

***Solution***

1. 



1. 



1. 



***Exercises Section* 1.2 − Functions**

(**1 − 7**) Determine whether each relation is a function and *find the domain and the range*.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. Let , find , , , and 
9. Let , find , , and 
10. Let , find 
11. Given: , find.
12. Given: , find 
13. Given: , find 
14. Given that . Find 
15. If , evaluate each of the following: 
16. Find 
17. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. For , determine

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. For , determine

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. For , determine

|  |  |  |
| --- | --- | --- |
|  |  |  |

1. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |

1. For , determine

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |