**2.3 Functions**

**CLASSROOM EXAMPLE 1 Deciding Whether Relations Define Functions**

Decide whether each relation defines a function.



**CLASSROOM EXAMPLE 2 Finding Domains and Ranges of Relations**

Give the domain and range of each relation. Tell whether the relation defines a function.

**(a) **

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **(b)** | **ce02-03-02b** | **(c)** | ***x*** | ***y*** |
| −3 | 5 |
| 0 | 5 |
| 3 | 5 |
|  |  |  | 5 | 5 |

**CLASSROOM EXAMPLE 3-4 Finding Domains and Ranges, Determining functions**

Give the domain and range of each relation. Use the vertical line test to determine if the relation is a function.

|  |  |  |  |
| --- | --- | --- | --- |
| **(a)** | **ce02-03-03a** | **(b)** | **ce02-03-03b** |
| **(c)** | **ce02-03-03c** | **(d)** | **ce02-03-03d** |

**CLASSROOM EXAMPLE 5 Identifying Functions, Domains, and Ranges**

Decide whether each relation defines *y* as a function of *x*, and give the domain and range.

(a)  (b)  (c) 

(d)  (e) 

**Function Notation**

**CLASSROOM EXAMPLE 6 Using Function Notation**

Let  and  Find each of the following.

(a)  (b)  (c) 

**CLASSROOM EXAMPLE 7 Using Function Notation**

For each function , find 

|  |  |  |  |
| --- | --- | --- | --- |
| **(a)** |  | **(b)** |  |
| **(c)** | **ce02-03-07c** | **(d)** | **ce02-03-07d** |

**Increasing, Decreasing, and Constant Functions**

**CLASSROOM EXAMPLE 9 Determining Intervals over Which a Function Is Increasing, Decreasing, or Constant**

|  |  |
| --- | --- |
| The figure shows the graph of a function. Determine the largest open intervals of the domain over which the function is increasing, decreasing, or constant. | MyCE02-03-09 |