Math 30-1

Function OPERATIONS



STUDENT NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CHAPTER EXAM DATE:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Math 30-1**

**Unit: Function Operations**

**Topic: Sums and Differences of Functions**

Objectives:

* Sketching the graph of a function that is the sum or difference of two functions
* Determining the domain and the range of a function that is the sum or difference of two functions.
* Writing the equation of a function that is the sum or difference of two functions

**Example**

Consider the function and . Use the table of values to comare the output values for , and given input values of -2, -1, 0, 1, and 2.

|  |  |  |  |
| --- | --- | --- | --- |
| *x* |  |  |  |
| -2 |  |  |  |
| -1 |  |  |  |
| 0 |  |  |  |
| 1 |  |  |  |
| 2 |  |  |  |

Sketch the graphs of ,, and on the grid provided.

![[image]]()

How could you use the values in the columns  and to determine the values in the column for?

How are the y-coordinates on the graph of related to those on the graphs ofand ?

Fill in the table.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Domain |  |  |  |

**Example**

Consider the function and . Use the table of values to comare the output values for , and given input values of -2, -1, 0, 1, and 2.

|  |  |  |  |
| --- | --- | --- | --- |
| *x* |  |  |  |
| -2 |  |  |  |
| -1 |  |  |  |
| 0 |  |  |  |
| 1 |  |  |  |
| 2 |  |  |  |

Sketch the graphs of ,, and on the grid provided.

![[image]]()

How could you use the values in the columns  and to determine the values in the column for?

How are the y-coordinates on the graph of related to those on the graphs ofand ?

Fill in the table.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Domain |  |  |  |
| Range  |  |  |  |

Determine the values of when x = 3.

**Example**

Consider the function and .

a) Determine the equation of the function .

b) Sketch the graphs of ,, and on the grid provided.

c) State the domain and range of .

d) Is equal to ? If not, what are the similarities and the    differences?

![[image]]()

**Example**

Sketch the graph of given the graphs of and 

**Example**

Sketch the graph of given the graphs of and 





**Summary**

|  |  |  |
| --- | --- | --- |
|  | *Sum of Functions* | *Difference of Functions* |
| Notation | or | or |
| Example |  ,  |  ,  |
| Domain |  |  |
| Range |  |  |

**Math 30-1**

**Unit: Function Operations**

**Topic: Product and Quotients of Functions**

Objectives:

* Sketching the graph of a function that is the product or quotient of two functions
* Determining the domain and the range of a function that is the product or quotient of two functions.
* Writing the equation of a function that is the product or quotient of two functions

**Example**

Consider the function and . Use the table of values to comare the output values for , and given input values of -2, -1, 0, 1, and 2.

|  |  |  |  |
| --- | --- | --- | --- |
| *x* |  |  |  |
| -2 |  |  |  |
| -1 |  |  |  |
| 0 |  |  |  |
| 1 |  |  |  |
| 2 |  |  |  |

Sketch the graphs of ,, and on the grid provided.

![[image]]()

How could you use the values in the columns  and to determine the values in the column for?

How are the y-coordinates on the graph of related to those on the graphs ofand ?

Fill in the table.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Domain |  |  |  |

**Example**

Consider the function and . Use the table of values to comare the output values for , and given input values of -2, -1, 0, 1, and 2.

|  |  |  |  |
| --- | --- | --- | --- |
| *x* |  |  |  |
| -2 |  |  |  |
| -1 |  |  |  |
| 0 |  |  |  |
| 1 |  |  |  |
| 2 |  |  |  |

Sketch the graphs of ,, and on the grid provided.

![[image]]()

How could you use the values in the columns  and to determine the values in the column for?

How are the y-coordinates on the graph of related to those on the graphs ofand ?

Determine the values of when x = 4.

Fill in the table.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| Domain |  |  |  |
| Range  |  |  |  |

**Example**

Consider the function and .

a) Determine the equation of the function .

b) Sketch the graphs of ,, and on the grid provided.

c) State the domain and range of .

![[image]]()

**Summary**

To combine two functions, , multiply or divide as follows:

*Product of Functions Quotient of Functions*

Notation

Domain

Range

**Math 30-1**

**Unit: Function Operations**

**Topic: Composite Function**

Objectives:

* Determining values of a composite function
* Writing the equation of a composite function and explaining any restrictions
* Sketching the graph of a composite function

Consider the function given by. This function can be thought of as being composed of two functions:

the “multiply by 2” function denoted by  and the “add 3” function denoted by .

Given that , determine an equation for  and 

The composite function, says first multiply by 2 and then add 3. Complete the arrow diagram below.

x multiplied by 2 2x add 3 2x+3

0

1

2

Composite function –

**Example**

If  and  determine each of the following.

a)  b) 

**Example**

If  and  determine each of the following.

a)  b)  c)  d) 

**Example**

If  and  determine each of the following.

a) 

b) 

c) Does the order matter when composing functions?

d) State the domain of,, , and.

**Example**

If  and . Determine the equation of each composite function, graph it and state its domain and range.

![[image]]()![[image]]()a)  b) 

**Example**

Determine two functions, and where  .

a)  b) 