Assignment 3
G11 MCF3M Functions and Applications
Due date: Tue 30 October 2018

October 26, 2018

1 Comments

Below, you may find the 15 exercises that comprise this assignment.

Make sure you take note of the due date and submit it on time.

All questions have the same value

Note: The statement of problem 7 on page 4 is as follows:

For each graph, draw a vertical line through it. Then circle the word that describes the graph.

1.1 The Characteristics of a Function

Text page 6

▶ **GOAL** Distinguish between a function and a relation.

Problem

MATH TERM

function: each x value has only one y value

relation: an x value may have more than one y value

Which of these representations are **functions**?

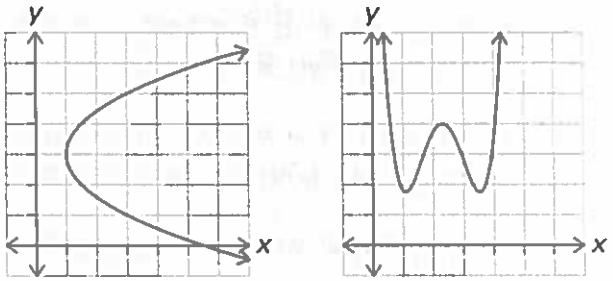
Set of Points

$\{(0, -2), (0, -1), (1, 0), (1, 5)\}$

Table of Values

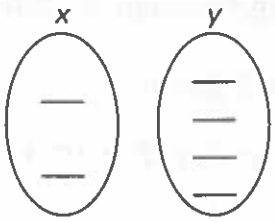
x	y
−1	−3
0	1
1	5
2	9

Graphs



Set of Points

A. Look at the set of points. Write each different x value and each different y value in the appropriate ovals.



Hint

The arrows complete the **mapping diagram** in part A.

B. Draw an arrow to connect the x and y values of each point in part A.

TURN

C. Circle the appropriate underlined word(s) to complete each sentence.

Each x value has/does not have only one y value.

This means the points represent a function/relation.

Table of Values

MATH TERM

domain: all possible x values

range: all possible y values

D. Now look at the table of values. Write the **domain** and **range** in the appropriate blanks.

Domain = {_____}

Range = {_____}

E. Circle the appropriate underlined word(s) to complete each sentence.

Each x value has/does not have only one y value.

This means the points represent a function/relation.

Graphs

F. Now look at the two graphs. Draw a vertical line through each graph.

G. Notice how many times the line crosses each graph. Then fill in the blanks to complete each sentence.

The vertical line crosses the first graph _____.

This means each x value _____ y value.

The vertical line crosses the second graph _____.

This means each x value _____ y value.

Write a Conclusion

H. Which of the four representations are functions? Circle the representations that are functions.

Reflecting

▶ Write the ways you would distinguish between a function and a relation.

_____

_____

_____

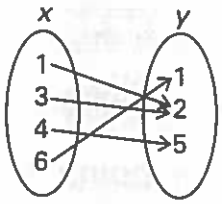
_____

PRACTISING

Text pages 13–16

2. For each mapping diagram, state the domain and range. Then circle the word that describes the diagram.

a)

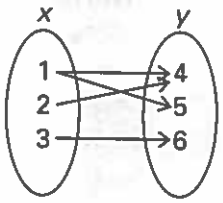


Domain = {_____}

Range = {_____}

function relation

b)

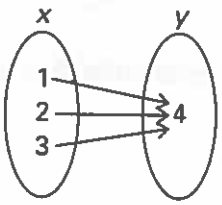


Domain = {_____}

Range = {_____}

function relation

c)

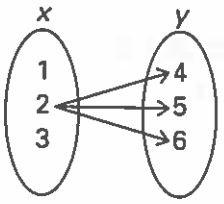


Domain = {_____}

Range = {_____}

function relation

d)



Domain = {_____}

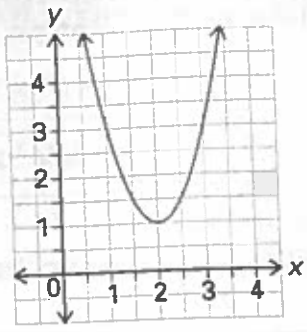
Range = {_____}

function relation

TURN

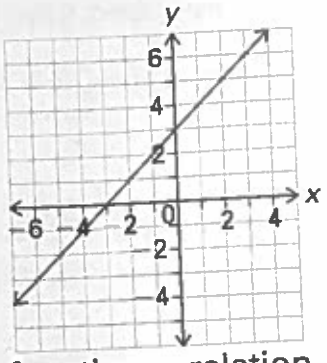
7. For each graph, draw a vertical line through it. Then circle the word that describes the graph.

a)



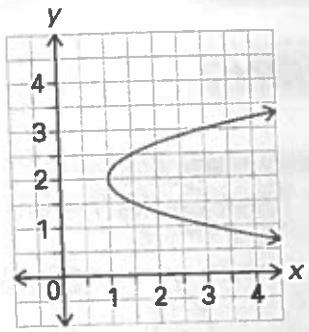
function relation

c)



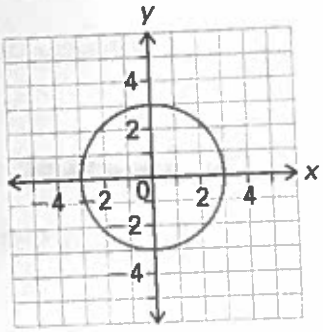
function relation

b)



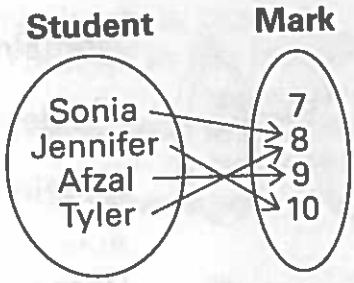
function relation

d)



function relation

9. Look at the mapping diagram below.



b) State the domain and range.

_____

_____

c) State whether or not the diagram represents a function.

_____

You will need
- calculator

1.3 Working with Function Notation

Text page 27

▶ **GOAL** Understand how to work with function notation.

Problem

The equation $f(x) = 2x^2 + 3x - 1$ represents a quadratic function. Evaluate:

a) $f(3)$ **b)** $f\left(\frac{1}{2}\right)$ **c)** $f(5) - f(4)$

a) Substitute $x = 3$ into the equation for $f(x)$. Then evaluate.

$f(3) = 2(\_\_\_)^2 + 3(\_\_\_) - 1$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

b) Substitute $x = \frac{1}{2}$ into the equation for $f(x)$. Then evaluate.

$f\left(\frac{1}{2}\right) = 2(\_\_\_)^2 + 3(\_\_\_) - 1$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

c) Fill in the blanks. Then use your calculator to evaluate.

$f(5) - f(4) = [2(\_\_\_)^2 + 3(\_\_\_) - 1] - [2(\_\_\_)^2 + 3(\_\_\_) - 1]$

$= [\_\_\_\_\_] - [\_\_\_\_\_]$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

TURN

Reflecting

▶ State the steps you would use to evaluate $f(2) + f(0)$ if $f(x) = -3x^2 + x + 5$. Then evaluate.

PRACTISING

Text pages 32–35

4. The equation $h(t) = 72 - 4.9t^2$ models the height of a falling stone above a river as a function of time. Evaluate:

a) $h(0)$

Substitute $t = 0$ into the equation for $h(t)$. Then evaluate.

$h(0) = 72 - 4.9(\_\_\_\_)^2$

$= \_\_\_\_\_$

b) $h(2.5)$

Substitute $t = 2.5$ into the equation for $h(t)$. Then use your calculator to evaluate.

$h(2.5) = 72 - 4.9(\_\_\_\_)^2$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

9. **i)** Substitute each x value into the appropriate equation for $f(x)$.

ii) Evaluate.

a) $f(x) = 9x + 1$ when $x = 2$

$f(2) = 9(\_\_\_) + 1$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

b) $f(x) = -2x - 3$ when $x = -1$

$f(-1) = -2(\_\_\_) - 3$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

c) $f(x) = 2x^2 + 5$ when $x = 3$

$f(3) = 2(\_\_\_)^2 + 5$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

d) $f(x) = 3x^2 - 4$ when $x = 4$

$f(4) = 3(\_\_\_)^2 - 4$

$= \_\_\_\_\_$

$= \_\_\_\_\_$

TURN

11. Given the equation $f(x) = x^2 - 6x + 9$, evaluate:

i) $f(0) =$ _____

$=$ _____

ii) $f(1) =$ _____

$=$ _____

$=$ _____

iii) $f(2) =$ _____

$=$ _____

$=$ _____

iv) $f(3) =$ _____

$=$ _____

$=$ _____

Hint

Substitute your answers from parts **i)** to **iii)**.

v) $[f(2) - f(1)] - [f(1) - f(0)] =$ _____

$=$ _____

$=$ _____

$=$ _____

vi) $[f(3) - f(2)] - [f(2) - f(1)] =$ _____

$=$ _____

$=$ _____

$=$ _____