

FOR GRADES 7-10

Differentiating Instruction

in

Algebra 1

Ready-to-Use Activities for All Students

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Introduction

My grandmother inspired me to become an educator. She was a teacher in a one-room schoolhouse in Plymouth, MI, in the 1930s, and she shared many stories of her 20 students who ranged in age from 5 to 18. Her students were not divided into groups based on chronological age; they worked with other students at their same learning level. It was common for more advanced students to assist less-accomplished students, giving my grandmother time to provide instruction and remediation for individuals and small groups of students. Once students could navigate the lessons independently, she was able to move students to the next level. Why do I mention my grandmother? I believe that teachers in the early 20th century used differentiated learning strategies on a daily basis. It was a survival strategy that worked, and we can learn from these early educators.

The idea for this resource stemmed from my frustration with not being able to find ready-to-use differentiated materials for algebra. The most readily available differentiated resources seem to address social studies material or K–8 curricula. However, the mixed-ability classrooms in our schools demand differentiated instruction for all subjects and all grade levels. Ready-to-use materials for middle and high school teachers are hard to find, yet they are necessary for teachers who do not have the time to create tiered activities to help their students achieve success.

How to Use This Book

Differentiating Instruction in Algebra 1 is not a textbook. Before students are assigned the activities in this book, they will likely require some level of direct instruction. This book contains four units covering introduction to functions, systems of linear equations, exponent rules and exponential functions, and quadratic functions. These units are very broad, and it would be impossible to cover all aspects of these topics given space constraints of this book. However, based on my experience, I have chosen lessons for each unit that most closely match what might be taught in Algebra 1 courses.

Each unit begins with launch scenarios and a preassessment that can be used to determine the readiness level of each student. Each lesson within the unit includes both group activities and individual practice pages that enable students to make

choices or are tiered to three readiness levels. Each unit ends with a project that enables students to demonstrate the knowledge they have acquired. Grading rubrics are provided within each unit, and an answer key for all four units is included at the end of the book.

In addition to using this resource in a general education classroom, it could also be used by parents who homeschool and need practice work for their children. Educators with gifted and talented students or students receiving special education resources will also benefit from the choice activities and the tiered learning opportunities.

Why Differentiate?

The techniques my grandmother used to teach her students were not called differentiation at that time, but her teaching incorporated strategies that are now considered best practices in education. Differentiation is defined by Tomlinson (2001) as providing different options of acquiring content, of processing or making sense of ideas, and of developing products that enable students to demonstrate their learning. I believe that differentiation includes offering choices to students, tailoring a homework assignment based on the needs of your students, and working with a group of students to customize learning. These are all things that educators do on a daily basis to meet the needs of their students.

Educators know students come to our classrooms with varied levels of understanding, experience, and interest in mathematics. Because of the large number of students taught in secondary classrooms, I do not believe it is practical to think that educators can tailor instruction to fit the varied interests and learning styles of every student. It is practical, however, to offer assignments and small-group activities that challenge students at their readiness level and scaffold them to the next level. Russian psychologist Lev Vygotsky introduced the concept of scaffolding in the early 20th century. Benson (1997) defined scaffolding as a design to support students until they are able to complete tasks independently. Benson noted that scaffolding involves the teacher identifying the skills or information students are missing and then bridging the gap so that students can acquire those skills or information. We, as educators, can build these bridges through the differentiated strategies included in this resource.

Alignment With National Standards

Each unit in *Differentiating Instruction in Algebra 1* contains lessons that are aligned with the Common Core State Standards (CCSS). “The standards were developed in collaboration with teachers, school administrators, and experts, to

provide a clear and consistent framework to prepare our children for college and the workforce” (Common Core State Standards Initiative, n.d., para. 1). According to the National Council of Teachers of Mathematics (2010), “states will be asked to adopt the Common Core State Standards in their entirety and include the core in at least 85 percent of the state’s standards in English language arts and mathematics” (para. 2).

As more districts adopt the CCSS, it is imperative that teachers review what they are teaching and how their lessons support the new learning standards. One challenge is that the high school mathematics standards are grouped by six categories: number and quantity; algebra; functions; modeling; geometry; and statistics and probability. Similar to previous high school mathematics standards, topics taught in Algebra 1 will be included in numerous categories, and it is sometimes difficult to separate the Algebra 1 and Algebra 2 standards. At the beginning of each unit, I have identified the standards that are addressed or partially addressed in each unit.

Summary of Differentiated Components

Following is a description of each type of differentiated/small-group activity that may be included in each unit. Many of the activities include three levels of work based on student readiness. For students who have not yet mastered the concepts of the lesson, the practice page will be indicated with a moon symbol at the top. Students working on level who are ready to practice the concepts with little assistance will complete the practice page with a sun symbol at the top. Students who have mastered the concepts and need to be challenged will complete the practice page with a star symbol at the top.

Preassessment

The preassessment can be used to determine the readiness level of each student for the lessons within a unit. There is a space for students to identify whether or not they are confident of their answer for each problem. Each question in the preassessment is tied directly to one of the subsequent lessons in the unit.

Learning Targets and Study Guide

The learning targets and study guide handout should be distributed to students at the beginning of the unit. It enables students to see what topics will be covered in the unit and can serve as a review guide. As a concept is taught, students can complete the learning target page with definitions and example problems.

Vocabulary Choice Board

The vocabulary choice board offers students the opportunity to choose how to demonstrate their understanding of the critical vocabulary. Choices include preparing LINC cards (Ellis, 2000), creating a graphic organizer, writing and delivering a news broadcast, drawing a cartoon strip, writing a creative story, writing and performing a rap, and acting out the words. LINC (Ellis, 2000) is a strategy that helps students learn and remember critical vocabulary. The acronym LINC represents: List the parts, Identify a reminding word, Note a LINCing story, Create a LINCing picture, and Self-test. The first step is to list the parts of the LINC cards, which include the new vocabulary term, the definition, the reminding word, the LINCing story, and the LINCing picture. After the definition is recorded, the reminding word is chosen. It must be a real word that has a meaning that the students already know. The LINCing story should be simple and must include the reminding word and connect it to the new word. The student can self-test by writing the new term and the reminding word on one side of a note card and then writing the definition, LINCing story, and LINCing picture on the other side of the note card. A rubric is included with the vocabulary choice board.

Checkerboard

The checkerboard puzzles encourage students to work in pairs or small groups to solve mathematical problems that review algebra concepts.

Tic-Tac-Toe Boards

These resources provide choices for students and can be used to review concepts or as homework. Students can choose the problems they want to complete. In addition, teachers can assign additional problems for students who need further practice.

Exit Slips

For each unit, there is a series of exit questions that can be used as formative assessments. The exit slip can be given to students approximately 10–15 minutes before the end of the class. Students then complete the questions before they leave the classroom. Teachers can use the responses from the exit slip to guide lesson planning for the next session.

Hexagon Puzzles

Each puzzle page includes 24 practice problems that increase in difficulty from left to right across the page. Students choose a starting point in the far left-hand column and complete the problem. If it is solved correctly, they will choose an adja-

cent problem in the next column and complete the problem. If it is solved correctly, they will continue this process, moving to the right. If at any time a problem is not solved correctly, the student must choose a different problem in the same column and complete the problem. When they solve a problem correctly, they move to the right. In order to complete the puzzle page, students must have a complete path with adjoining hexagons from the left to the right. Students can either be provided with an answer key to check their answers as they work, or the teacher can check their answers for them. Students may also be assigned all of the problems for more practice.

Agenda

The agendas include three sets of practice problems. The first group is called *Imperatives*, and students complete all of the problems. This set of problems is generally a review of basic concepts. The second section is called *Negotiables*, which generally includes three problems of varying difficulty. Students select at least two problems to complete based on their interest. The last section is *Options*, which includes an optional, more challenging problem. Depending on each student's progress, the number of problems assigned can be varied.

Structured Academic Controversy

This activity enables students to discuss and support both sides of a mathematical argument (Johnson, Johnson, & Smith, 2000).

Projects

Several of the units include a culminating project that can be used as an assessment or be assigned to students who are working above level as a challenge problem.

RAFT Activity

This activity enables students to demonstrate their understanding of a specific concept through a writing assignment. Students choose a role, an audience, a format, and a topic according to their interests (Santa, 1988). Students may also propose a role, audience, format, and topic that match their personal interests. A rubric is provided.

TriMind Activity

Students choose from three activities based on Sternberg's (2010) creative, analytical, and practical thinking styles. A rubric is provided.

Think Dots

This tiered activity allows students to work in small groups to solve six problems. The problems can be done in any order, or the order can be determined by rolling a die. If students are working in mixed-ability groups, students may be asked to demonstrate how to complete their problem to their group. Students can also work independently.

Unit 1

Introduction to Functions and Relationships

Beginning algebra students need to take their understanding of linear equations and solving simple one-variable equations and apply it to studying special relations of data called functions. Functions describe everyday situations where one specific quantity determines the value of another. Students must learn to write and evaluate functions because they describe a unique relationship between two quantities and are frequently used to model everyday situations.

This unit begins with a preassessment and three real-life applications of functions that can be discussed in small groups and then as a larger group. Many of the activities will offer the students an opportunity to choose learning activities according to their learning style, personal interests, and readiness level.

What Do We Want Students to Know?

Common Core State Standards Addressed: <ul style="list-style-type: none">• 8.F.1, 4• A.CED.1, 2• F.IF.1, 2, 5• F.BF.1c	Big Ideas <ul style="list-style-type: none">• Not all relationships are functions.• A function denotes a special relationship between independent and dependent variables.• A function must pass the vertical line test.
	Essential Questions <ul style="list-style-type: none">• What makes a relationship a function?• How is the vertical line test used to determine if a relationship represents a function?• Does it matter that a set of data does not represent a function?

Critical Vocabulary

Domain	Range	Vertical line test
Function notation	Relation	Input
Dependent variable	Function	
Output	Independent variable	

Unit Objectives

As a result of this unit, students will know:

- a function is a special type of relation,
- the difference between a relation and a function,
- all functions are relations but not all relations are functions,
- the difference between an independent and dependent variable, and
- $f(x)$ is read “ f of x ” and $f(-1)$ means to evaluate the function rule by substituting -1 into the expression.

As a result of this unit, students will understand that:

- in order for a relation to be a function, each domain element is associated with a unique range element;
- if a relation is a function, it can be written as an equation using function notation; and
- the independent variable is graphed on the horizontal axis, and the dependent variable is graphed on the vertical axis.

As a result of this unit, students will be able to:

- use the vertical line test to tell if a relationship is a function,
- identify the domain and range of relations and functions,
- determine reasonable domains for given situations, and
- evaluate functions for a given domain or range.

Launch Scenarios

- If we listed 10 cities and their corresponding area codes, would these relations represent a function? (Lesson 1)
- A lawyer charges \$150 per hour for his services. Identify the dependent and independent variables, and then write the equation to represent the function. (Lesson 2)
- Give a real-life situation that can be modeled by the function $h(t) = 5 + 5t$. (Lesson 3)

Unit Overview: Introduction to Functions and Relationships

(Assumes a 50–60-minute class period)

Lesson	Whole-Class/Small-Group Discussion and Activities	Individualized Learning Activities
Preassessment (1/2 period)	Give the preassessment at least several days prior to beginning the unit (20 minutes)	
Lesson 1: Introduction (2 periods)	Share results of the preassessment (20 minutes)	
	Introduce launch scenarios and discuss possible solutions (10 minutes)	
	Hold a classroom discussion on functions (20 minutes)	Learning Targets and Study Guide (15 minutes)
		Vocabulary Choice Board (15 minutes)
		Agenda (20 minutes)
		Exit Slip (10–15 minutes)
Lesson 2: Writing Functions (1–2 periods)	Hold a classroom discussion on writing functions (20 minutes)	
		Agenda (30 minutes)
		Tic-Tac-Toe Board (30 minutes)
		Exit Slip (10–15 minutes)

Lesson	Whole-Class/Small-Group Discussion and Activities	Individualized Learning Activities
Lesson 3: Evaluating Functions and Function Notation (1–2 periods)	Hold a classroom discussion on evaluating functions and function notation (20 minutes)	
		Agenda (30 minutes) Hexagon Puzzles (20 minutes) Exit Slip (5–10 minutes)
Lesson 4: Wrap Up and Assessment (2 periods)	Collect learning targets and study guide handouts and vocabulary choice board projects	
		Think Dots (30 minutes) Tri-Mind Activity (30 minutes) Exit Slip (15 minutes)

Introduction to Functions and Relationships

Preassessment

Directions: Solve the following problems to the best of your ability, and then rate your confidence in your answer in the space provided. Skip questions you do not know. This will not be graded.

1. Identify the domain and range for the following relations:

a. $\{(2,4), (1,3), (7,5), (2,5), (4,4)\}$

Domain: _____

Range: _____

_____ I'm sure

_____ I'm not sure

x	-2	-1	0	1	2
y	4	3	1	5	-3

Domain: _____

Range: _____

2. Circle the relationships that represent functions.

x	-1	0	1	2	3	4	5
y	2	4	2	5	2	6	9

b. $\{(2,4), (1,3), (7,5), (2,6), (4,4)\}$

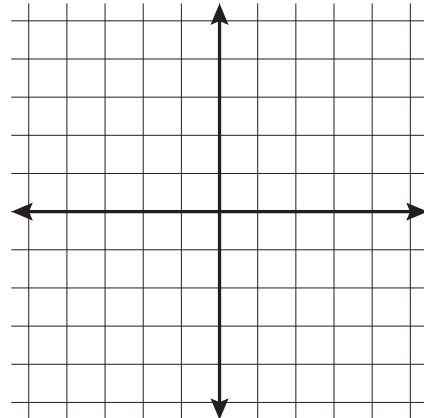
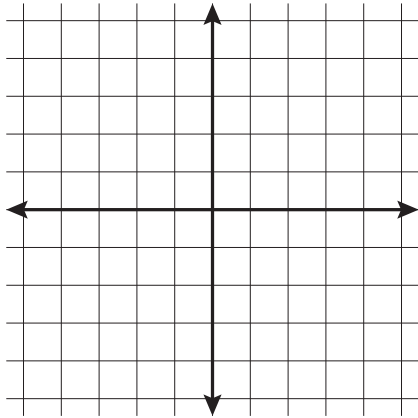
c. $y = 2x - 4$

d. $y^2 = 2x^2 + 8$

_____ I'm sure

_____ I'm not sure

3. Sketch a graph that represents a function and a graph that does not represent a function.



_____ I'm sure
 _____ I'm not sure

4. Evaluate the functions for the given variable.

a. $f(x) = 2x + 7$ for $x = -1$

b. $f(x) = -2x + 7$ for $x = 5$

c. $g(x) = x^2 - 5$ for $x = 2$

d. $g(x) = 4x - 5$, find x when $g(x) = 0$

_____ I'm sure
 _____ I'm not sure

5. Using $f(x) = 2x - 1$ and $g(x) = -4x + 4$, simplify the following expressions:

a. $f(x) + g(x)$

b. $g(x) - f(x)$

c. $f(x) - g(x)$

_____ I'm sure
 _____ I'm not sure

6. Identify the independent and dependent variables and then write the function for the situation described below.

A plumber charges \$50.00 for a service call to your home plus \$45.00 per hour.

_____ I'm sure
 _____ I'm not sure

Introduction to Functions and Relationships

Learning Targets and Study Guide

At the end of this unit, every student should be able to say:

Learning Target	Explain and Give an Example
I can determine the domain and range for a function. Initial here when mastered _____	
I can determine if a table of data represents a function. Initial here when mastered _____	
I can determine if an equation represents a function. Initial here when mastered _____	
I can sketch a graph that is a function and a graph that is not a function. Initial here when mastered _____	
I can explain how to evaluate a function. Initial here when mastered _____	
I can show how to simplify expressions written in function notation. Initial here when mastered _____	
I can identify independent and dependent variables. Initial here when mastered _____	
I can write a function to represent an everyday situation. Initial here when mastered _____	
I can solve a real-life story problem involving functions. Initial here when mastered _____	

Introduction to Functions and Relationships

Vocabulary Choice Board

Directions: Using the critical vocabulary for the unit, choose one of the following methods to demonstrate your knowledge of the mathematical terms.

LINCS Cards	Graphic Organizer	News Broadcast
<p>Prepare a LINCS card for each vocabulary word to demonstrate your understanding of the vocabulary words.</p> <p><i>(logical-mathematical)</i></p>	<p>Construct a graphic organizer of your choice to define each word and demonstrate your understanding of the vocabulary words and how they fit into the current unit.</p> <p><i>(verbal/language-mathematical)</i></p>	<p>Write a news broadcast that defines all of the vocabulary words, and provide stories that demonstrate your understanding of the vocabulary words. Turn in your news broadcast, and then present it to the class.</p> <p><i>(intrapersonal-language)</i></p>
Nature Survival	Creative Story	Poster Board
<p>Prepare a nature survival guide about how each of the vocabulary words would be used if you were stranded on a deserted island. The guide must demonstrate your understanding of the vocabulary words.</p> <p><i>(natural-language)</i></p>	<p>Write a creative story with color illustrations that demonstrates your understanding of the vocabulary words.</p> <p><i>(verbal-language)</i></p>	<p>Prepare an 11" x 14" poster board that contains the definitions of the vocabulary words and includes one real-life example for each word that demonstrates your understanding of the definition.</p> <p><i>(language-spatial)</i></p>
Cartoon	Rap or Song	Acting Out
<p>Prepare a cartoon strip with at least five frames that defines each word and is illustrated with appropriate pictures to demonstrate your understanding of the vocabulary words.</p> <p><i>(visual-spatial)</i></p>	<p>Write a rap or a song containing all of the vocabulary words and their correct definitions. Perform your rap or song for the class.</p> <p><i>(musical-language)</i></p>	<p>Write a script and then act out the words with their correct definitions. Use props if appropriate.</p> <p><i>(kinesthetic-language)</i></p>

Critical Vocabulary

Domain
Function notation
Dependent variable
Output

Range
Relation
Function
Independent variable

Vertical line test
Input

Introduction to Functions and Relationships

Vocabulary Choice Board Rubric

Grading scale:				
	3 Well done	2 Close to requirements	1 Needs more work	
Choice	Definitions	Illustrations and/ or creativity	Neatness	Other
LINCS cards	Definitions demonstrate knowledge of vocabulary. Score _____	The illustrations are appropriate and creative. Score _____	The cards are easy to read. Score _____	Semantic connections between words are demonstrated. Score _____
Graphic organizer	Definitions demonstrate knowledge of vocabulary. Score _____	The graphic organizer creatively displays the definitions. Score _____	The graphic organizer is easy to read. Score _____	The graphic organizer choice is appropriate for this assignment. Score _____
News broadcast	Definitions demonstrate knowledge of vocabulary. Score _____	The news broadcast is creative and holds the attention of the audience. Score _____	The news broadcast is easy to read. Score _____	Good presentation skills are demonstrated. Score _____
Nature survival guide	Definitions demonstrate knowledge of vocabulary. Score _____	The guide contains illustrations that are appropriate. Score _____	The guide is easy to read. Score _____	The final product resembles a survival guide. Score _____
Creative story	Definitions demonstrate knowledge of vocabulary. Score _____	The story contains illustrations that are appropriate. Score _____	The story is easy to read. Score _____	The story is interesting. Score _____
Poster board	Definitions demonstrate knowledge of vocabulary. Score _____	The poster board includes illustrations that are appropriate. Score _____	The poster board is easy to read. Score _____	Real-life examples are included for each vocabulary term. Score _____
Cartoon	Definitions demonstrate knowledge of vocabulary. Score _____	The cartoon includes illustrations that are appropriate. Score _____	The cartoon is easy to read. Score _____	The cartoon contains a minimum of five frames. Score _____
Rap or song	Definitions demonstrate knowledge of vocabulary. Score _____	The rap or song is creative. Score _____	The lyrics are easy to read. Score _____	Good performance skills are demonstrated. Score _____
Acting out	Definitions demonstrate knowledge of vocabulary. Score _____	The script is creative. Score _____	The script is easy to read. Score _____	Good performance skills are demonstrated. Score _____
				Total: _____/12= _____%

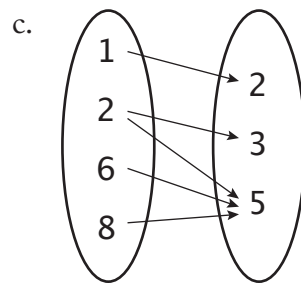
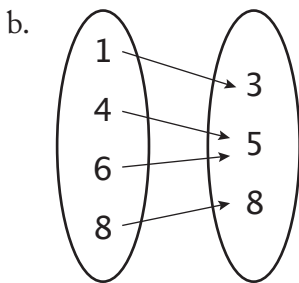
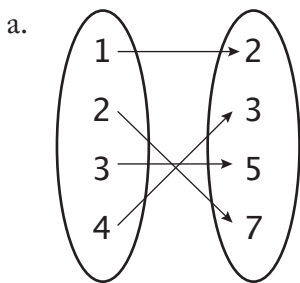
Comments:

Lesson 1: Introduction

Agenda

Imperatives (You must do all three of these.)

1. Determine whether the following relations are functions. Identify the domain and range for those that are functions.



Domain: { } Domain: { } Domain: { }
 Range: { } Range: { } Range: { }

2. Determine whether the following relations are functions. Identify the domain and range for those that are functions.

- a. $(-3, -8), (-2, -5), (-3, -2), (0, 1), (1, 4), (2, 7)$

Domain: { } Range: { }

b.

x	-3	-2	-1	0	1	2	3	4	5
y	-2	-5	-3	1	-2	-5	1	-2	-5

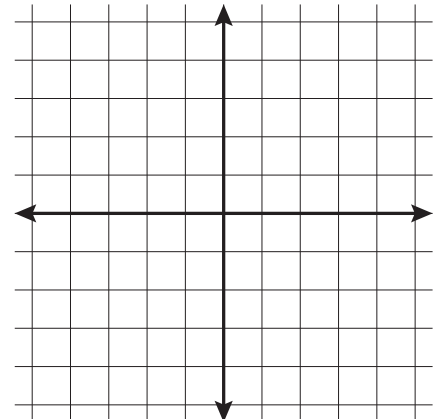
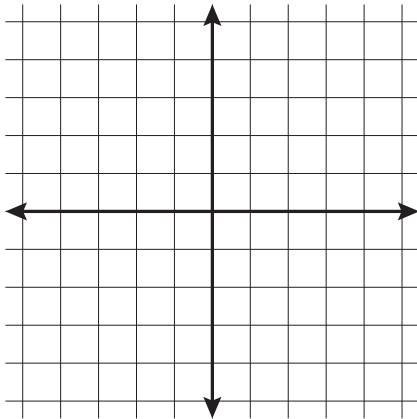
Domain: { } Range: { }

c.

x	-3	-2	-1	0	1	2	3	4	5
y	1	1	1	1	1	1	1	1	1

Domain: { } Range: { }

3. Draw two graphs: one that represents a function and one that does not.



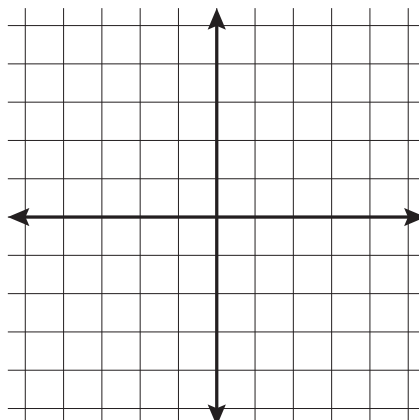
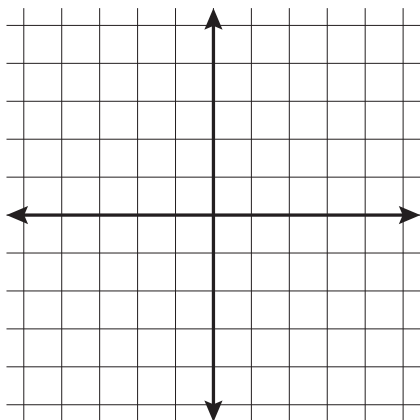
Negotiables (You must do at least two of these.)

1. Determine whether the following relationships represent functions. Explain your answers. If you answer no, give a counterexample.
 - a. A person and his or her birth date
 - b. First name and last name
 - c. City and zip code
 - d. Last name and first name

2. Using the previous question as an example, identify two new relationships that are functions and two new relationships that are not functions.

Relationships That Are Functions	Relationships That Are Not Functions

3. Explain how the vertical line test is used to determine whether a relation is a function. Draw two graphs: one that is a function and one that is not a function. Draw the vertical line where appropriate to test each function.



Options (You may choose to do these problems.)

1. Name four different ways to represent a relation or a function.
2. Give an example of a relation that is a function, and represent it in the four ways you listed.

Lesson 1: Introduction

Exit Slip

1. Explain how a function is a special type of relation.
2. Explain how the vertical line test is used to determine if a relation is a function.
3. In the first table, insert the missing numbers so that the table represents a function. In the second table, insert the missing numbers so that the table does not represent a function.

This is a function:

x	-3	-2	-1	0	1	3	4	5
y	0	1	-3	1	-2	1	-2	-5

This is not a function:

x	-3	-2	-1	0	1	3	4	5
y	0	1	-3	1	-2	1	-2	-5

Lesson 2: Writing Functions

Agenda

Imperatives (You must do all three of these.)

1. Use the slope formula $m = \frac{y_2 - y_1}{x_2 - x_1}$ to determine the slope of the lines containing the following

points. Keep your answers as reduced fractions.

a. (3,4) and (4,6) slope of the line: _____

b. (2,-4) and (0,8) slope of the line: _____

c. (3,-4) and (1,-5) slope of the line: _____

d. (-2,1) and (-1,7) slope of the line: _____

2. Determine the y-intercept from the following tables.

a.

x	-3	-2	-1	0	1	2	3	4
y	9	7	5	3	1	-1	-3	-5

y-intercept: _____

b.

x	-3	-2	-1	0	1	2	3	4
y	-2	-1	0	1	2	3	4	5

y-intercept: _____

3. Determine if the following relationships represent functions. If they do, then write the equation that represents the function.

a.

x	0	1	2	3	4	5	6	7
y	-1	1	3	5	7	9	11	13

Equation: _____

b.

x	-3	-2	-1	0	1	2	3	4
y	7	4	1	-2	-5	-8	-11	-14

Equation: _____

4. Identify the independent and dependent variables in the following situations. An example is shown below.

An electrician's fee is based on the number of hours worked in your home.

Rewritten with the word "depends": The fee depends on the hours worked.

Independent variable: electrician's fee Dependent variable: hours worked

- a. The cost of shipping a package is determined by its weight.
 Rewritten with the word “depends”: _____
 Independent Variable: _____ Dependent Variable: _____
- b. The cost of renting a car is based on the number of days it is rented.
 Rewritten with the word “depends”: _____
 Independent Variable: _____ Dependent Variable: _____
- c. Apples are sold by the pound.
 Rewritten with the word “depends”: _____
 Independent Variable: _____ Dependent Variable: _____

Negotiables (You must do at least two of these.)

Identify the independent and dependent variables and then write the equation for each situation.

1. An accountant’s fee is \$150 per hour for services.
 a. Independent Variable: _____ Dependent Variable: _____
 b. Function: _____
2. The cost to get into the carnival is \$5.00, and you have to pay \$2.00 for each ride.
 a. Independent Variable: _____ Dependent Variable: _____
 b. Function: _____
3. Write functions to represent the following tables.

a.

x	-5	-3	-1	1	3	5	7	9
$f(x)$	-17	-11	-5	1	7	13	19	25

Function: _____

b.

x	-6	-3	-1	2	3	6	8	9
$f(x)$	-1	0.5	1.5	3	3.5	5	6	6.5

Function: _____

4. Write a function to represent the following situation. Identify the independent and dependent variables.

Katie received \$200 from her grandparents on her 10th birthday. She immediately put the money into her large piggy bank. She also receives an allowance of \$25 per week for the chores she does around the house. If she puts \$20 per week from her allowance into the piggy bank and never takes any money out, how much will be in the piggy bank at any specific time?

- a. Independent Variable: _____ Dependent Variable: _____
- b. Function: _____
- c. How much money will she have in the piggy bank after 3 weeks? _____
- d. How much money will she have in the piggy bank after one year? _____
- e. How much money will she have in the piggy bank after 5 years? _____

Options (You may choose to do this problem.)

1. Write scenarios that could be represented by the following sets of data or equations. Be sure to identify the independent and dependent variables.

a.

x	1	2	3	4	5	6	7	8
y	2.50	5	7.5	10	12.50	15	17.50	20

b.

x	0	5	8	10	12	15	20	50
y	50	60	66	70	74	80	90	150

c. $y = 2x + 25$

d. $h = 5t + 100$

Lesson 2: Writing Functions

Tic-Tac-Toe Board

Directions: Choose three problems in a row, in a column, or on a diagonal. Solve the problems and show your work on a separate sheet of paper. Circle the problems you choose on this page and then reference them on your work paper with the number from the square.

<p>1</p> <p>Write a function to represent the table of data.</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">x</td> <td style="padding: 5px; text-align: center;">y</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">-1</td> <td style="padding: 5px; text-align: center;">-8</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">0</td> <td style="padding: 5px; text-align: center;">-3</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">1</td> <td style="padding: 5px; text-align: center;">2</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">2</td> <td style="padding: 5px; text-align: center;">7</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">3</td> <td style="padding: 5px; text-align: center;">12</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">4</td> <td style="padding: 5px; text-align: center;">17</td> </tr> </table>	x	y	-1	-8	0	-3	1	2	2	7	3	12	4	17	<p>2</p> <p>Write a function to represent each situation:</p> <ol style="list-style-type: none"> a. The cost of gasoline is \$3.59 per gallon. b. Adam's weekly salary is \$1,250. c. Soda is \$1.89 for a two-liter. 	<p>3</p> <p>Identify the independent and dependent variables for each function:</p> <ol style="list-style-type: none"> a. Zach earns \$7.50 per hour working at the grocery store. b. Erin's grade reflects the number of hours she studies.
x	y															
-1	-8															
0	-3															
1	2															
2	7															
3	12															
4	17															
<p>4</p> <p>Write a function to represent the situation described below. Identify the independent and dependent variables. A cell phone plan charges \$25 per month to use the phone, plus \$0.30 for each text message or phone call.</p>	<p>5</p> <p>Write a scenario to represent the function below. Identify the independent and dependent variables.</p> $f(x) = 75 + 3x$	<p>6</p> <p>Write a function to represent each situation.</p> <ol style="list-style-type: none"> a. The cost of apples is \$1.69 per pound. b. The cost to copy each page is \$0.10. c. The health club charges a joining fee of \$125 plus \$57 per month. 														
<p>7</p> <p>Write a function to represent each situation. Identify the independent and dependent variables.</p> <ol style="list-style-type: none"> a. The cost of bananas is \$0.59 per pound. b. The lawn service company charges \$20.00 per week. c. The tutor charges \$25.00 per hour. 	<p>8</p> <p>Identify the independent and dependent variables for each function.</p> <ol style="list-style-type: none"> a. The cost of a holiday wreath is \$1.00 per inch plus \$3.00 for a bow. b. The candy costs \$1.50 per pound. 	<p>9</p> <p>Fill in the missing values in the table to represent a linear function.</p> <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">x</td> <td style="padding: 5px; text-align: center;">y</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">-3</td> <td style="padding: 5px; text-align: center;">37</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">-1</td> <td style="padding: 5px; text-align: center;">19</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;"> </td> <td style="padding: 5px; text-align: center;">1</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">4</td> <td style="padding: 5px; text-align: center;">-26</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">7</td> <td style="padding: 5px; text-align: center;"> </td> </tr> <tr> <td style="border-right: 1px solid black; padding: 5px; text-align: center;">8</td> <td style="padding: 5px; text-align: center;">-62</td> </tr> </table>	x	y	-3	37	-1	19		1	4	-26	7		8	-62
x	y															
-3	37															
-1	19															
	1															
4	-26															
7																
8	-62															

