Packet 4: Functions

Dear Parents/Guardians,

Packet 4 introduces functions. In Lesson 1, students represent situations with words, pictures, tables, graphs, and equations. They determine when graphs are linear or non-linear. In Lesson 2, students formally define functions and determine if a representation is a function. In Lesson 3, students solve problems involving rates, using the representations from previous lessons.

Multiple Representations

Students interpret situations involving changes in area and money over time using a variety of representations.

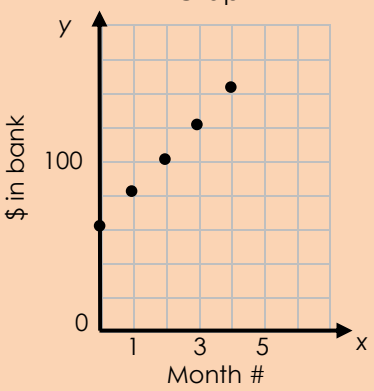
Example: Nathan initially had $60 in his bank account. Every month he deposits another $20 into his account.
Represent Nathan's situation as a table, an equation, and in a graph.

Table

month # (x)	$ in bank (y)
0	60
1	80
2	100
3	120
4	140

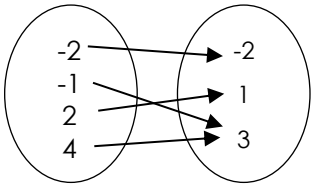
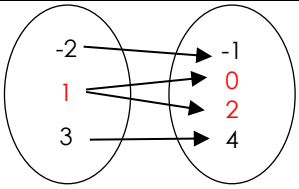
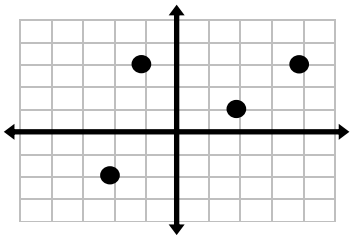
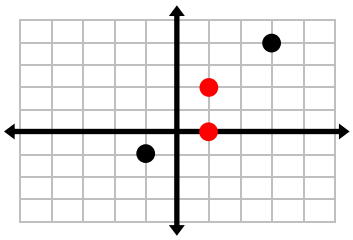
Equation
$y = 60 + 20x$

Graph



Functions and Non-Functions

A function is a rule that assigns each input value exactly one output value. Below are four representations commonly studied when determining if a given relationship among two quantities is a function. (The red highlights where the relationship is not a function.)

	Function	Not a Function
Table of Numbers	x (input): 2, -1, 4, -2 y (output): 1, 3, 3, -2	x (input): 1, 1, 3, -2 y (output): 2, 0, 4, -1
Mapping Diagram		
Ordered Pairs	(2,1),(-1,3),(4,3),(-2,-2)	(1,2),(1,0),(3,4),(-2,-1)
Graph		

Center For Mathematics And Teaching

Math Links
GRADE 8

By the end of the packet, your student should know…

- How to represent situations with words, pictures, tables, graphs and equations [Lesson 4.1]
- When a graph is linear or nonlinear, and when it is increasing or decreasing [Lesson 4.1]
- The definition of a function [Lesson 4.2]
- When a representation is a function [Lesson 4.2]
- How to solve and interpret rate situations with words, pictures, tables, graphs, and equations [Lesson 4.3]

Additional Resources

- For definitions and additional notes please refer to Student Resources at the end of this packet.