Identifying Functions

Notes	Video Links & Practice Space
Vocabulary **Dependent Variable:** the _____ value of a function, typically the y-value **Domain:** the complete set of possible values of the _____ of a function or relation **Function:** a mathematical relation for which each _____ of the domain corresponds to exactly one element of the range **Independent Variable:** the _____ value of a function, typically the x-value **Ordered Pair:** a pair of numbers used to locate a point on a coordinate plane written in the form _____, where x is the x-coordinate and y is the y-coordinate **Range:** the complete set of possible values of the _____ of a relation or function **Relation:** a _____ of input-output pairs	**Vocabulary (1:50)**

Learn to Find the Domain and Range of a Relation The domain are the "x" or input values. The range are the "y" or the output values. Coordinate pairs are written in the form (x, y) For the _____ pair (3, -4): 3 is the __ value and -4 is the y-value For the relation: (-1, -3) (2, 4) (5, 7) The _____, x-values, are {-1, 2, 5} The _____, y-values, are {-3, 4, 7}	**Finding Domain and Range with relations (1:07)**
Practice 1. Let's find the domain and range of the relation below: (-4, -7) (-1, -5) (0, 2) (3, 8) (6, 9)	**Finding domain and range 1 (2:25)**
2. Let's find the domain and range of the relation below: (-2, -1) (-1, 0) (0, 5) (2, 7) (5, 8)	**Finding domain and range 2 (2:49)**

Finding the Domain and Range of a given Graph

We can also determine the _____ and range of a relation graphed on the coordinate plane.

We will analyze the graph along both _____ to determine the domain and _____.

Sometimes, it may not be possible to describe the domain and range as a list of numbers.

Some relations represented by an _____ or _____ can have too many values to list, because it is more than just individual points. In this case, an **inequality** could be used to describe the domain and range.

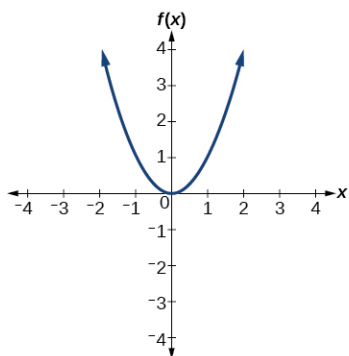**Finding Domain and Range with graphs (1:02)**

Practice

3.
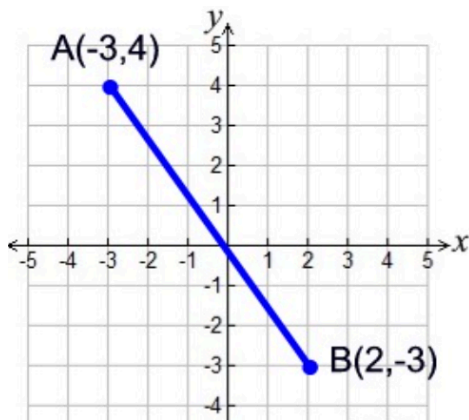
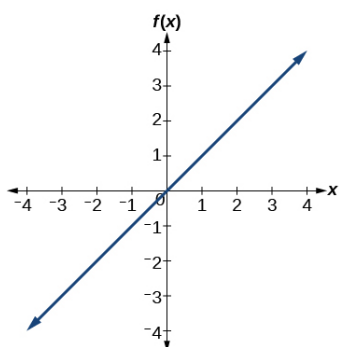Domain: _____

Range: _____

Finding domain and range 3 (2:49)

4.

f(x)

Domain: _____

Range: _____

Finding domain and range 4 (2:45)

5.

f(x)

Domain: _____

Range: _____

Finding domain and range 5 (1:43)

Learn to Determine Whether a Relation is a Function

A special type of relation where **every input has exactly one output** is known as a _____.

 If the **input (x)** values repeat and are paired with more than one _____ **(y)** value, then the relation is not considered a function.

This is because the **output values "depend"** on the input values and cannot be different for the same input value.

The output can be referred to as the dependent variable, and the input can be referred to as the independent _____.

We can use the _____ line test to determine if a particular graph represents a function.

Identifying Relations that are Functions (2:10)

Practice

   6. Are these functions?

{(3, 7), (4, 3), (-6, 11)} _____

{(2, 1), (5, -3), (2, 6)} _____

{(0, 2), (3, 4), (0, 2)}   _____

Identifying functions 6 (3:10)

7. Do these two tables represent functions?

This relation _____ a function
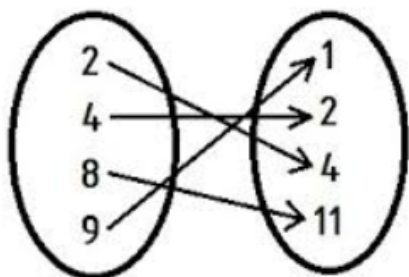
x	1	5	-1
y	6	0	1

This relation _____ a function

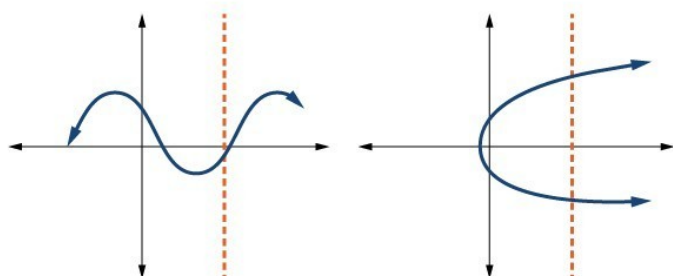| x	3	5	3
y	0	-1	9

Identifying functions 7 (3:11)

8. Does this mapping diagram represent a function?

This relation _____ a function

Identifying functions 8 (2:22)

9. How can we identify a graph to be a function?

Identifying functions 9 (1:50)

Intervals of Change

The behavior of a function can be described in many ways, depending on the situation.

Graphs are a good way to present information about how two quantities are related.

We have **three** main types of intervals:

Increasing: a line that trends _____ from left to right across the graph

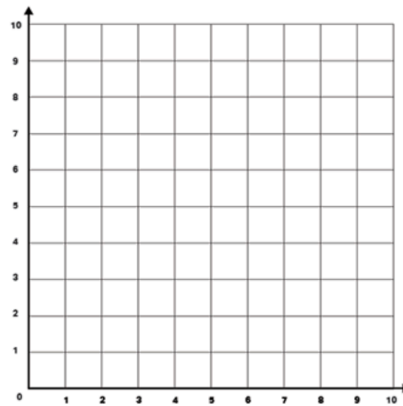**Decreasing:** a line that trends _____ from left to right across the graph.

Constant: a line that is _____ across the graph from right to left

Some graphs have **different intervals of change**. These are known as **piecewise functions**, which consist of different functions along the graph.
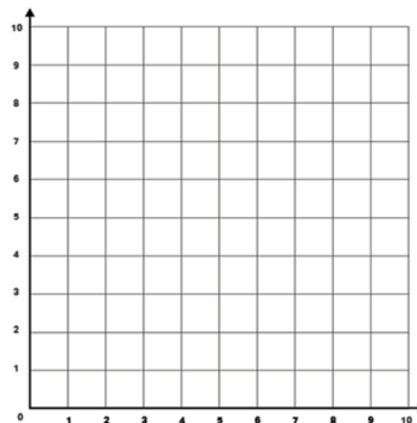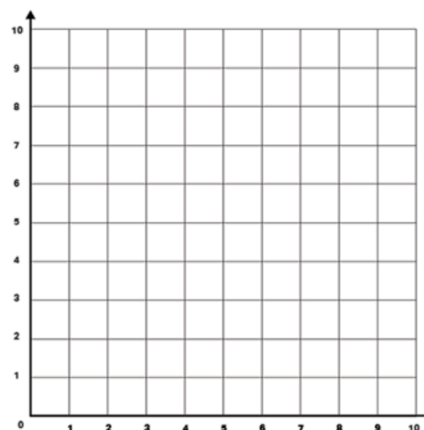
An example of a piecewise function is below:
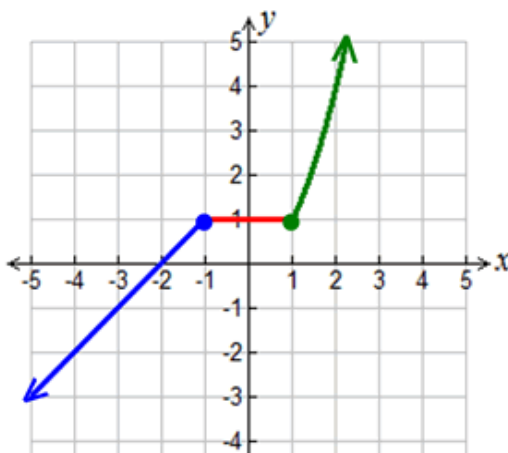
Increasing (1:13)

Decreasing (1:26)

Constant and Piecewise (2:07)

Learn to describe a graph

We can use graphs and intervals to describe real world scenarios.

The input (x) values, output (y) values, and the overall trend of the data will help us to determine what is happening in the real-world scenario.

The graph below illustrates Pam's drive to work The x-axis represents time and the y-axis represents miles driven.
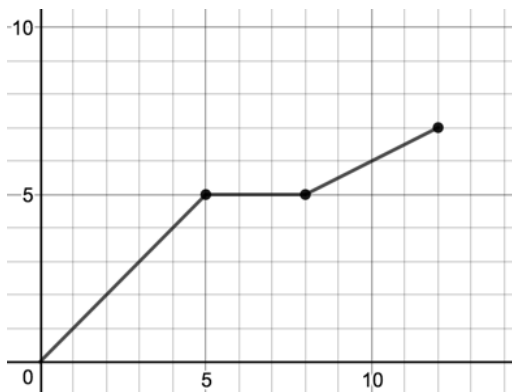
Describing a Graph with Intervals (7:39)

Does this graph show a function? Why or why not?

Using interval notation, where is the graph increasing, decreasing and constant?

How could we describe this real-world scenario?

Learn to Sketch a Graph From a Real-World Description

Real-world situations can be represented with a graph, and you can also create a graph to represent a real-world situation.

There can be many pieces of information to explain the scenario. Building the graph, _____ can help organize the sketching process.

First you will want to___ the graph. Then label the _____ appropriately given the scenario.

There are different ways to sketch a graph, increase or decrease can be represented by a _____ or a_____.

Learning to Sketch a Graph (1:00)

Practice

10. Matilda makes and sells quilts. This graph represents days passed (x-axis) and quilt inventory (y-axis).

- On days 1 through 3 Matilda sews one quilt each day.
- On day 4 Matilda takes the day off to go to the beach
- On days 5 and 6 Matilda sews 2 quilts each day
- On day 7 Matilda sells 5 quilts in her Etsy shop, and she sews one new quilt
- On Day 8, Matilda sews three quilts.
- On day 9, Matilda takes the day off to watch her two nieces
- On day 10 Matilda sells two quilts in her Etsy shop and doesn't sew any new ones

Let's graph this scenario using a piecewise function.

Sketching a graph 10 (4:35)