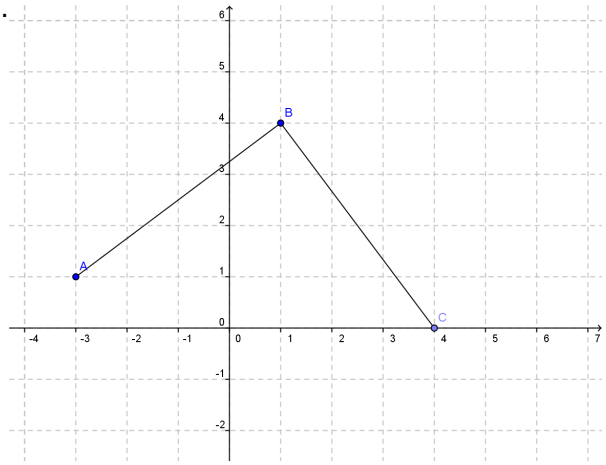
5.3 Features of Functions

A Practice Understanding Task

For each graph, determine if the relationship represents a function, and if so, state the key features of the function (intervals where the function is increasing or decreasing, the maximum or minimum value of the function, domain and range, x and y intercepts, etc.)

1.



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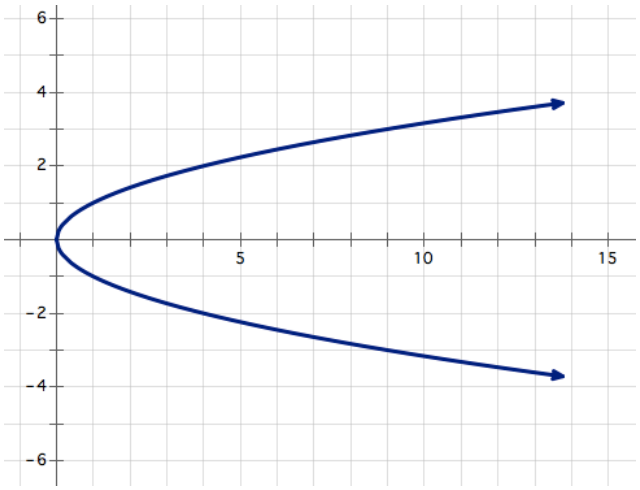

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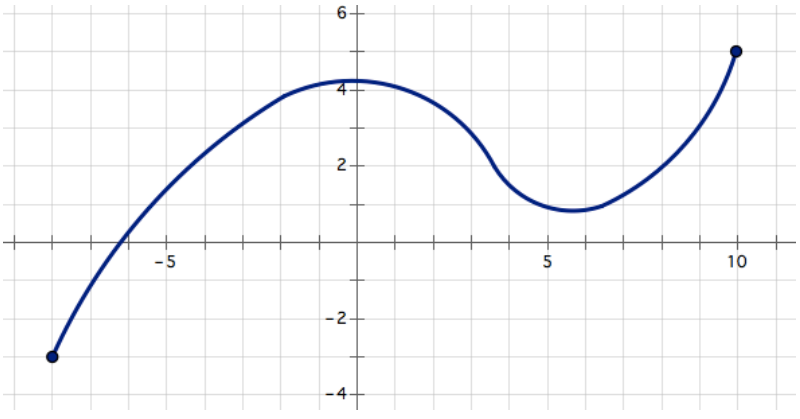

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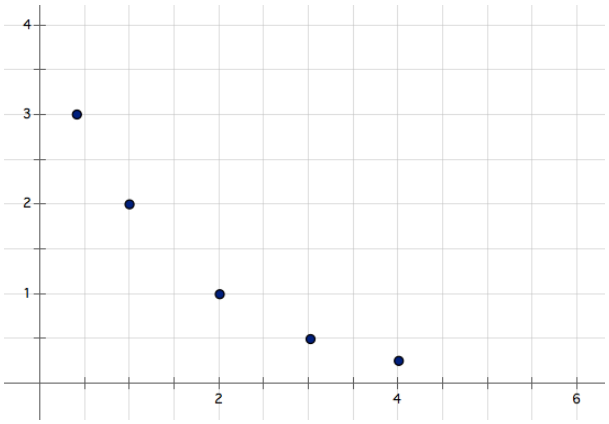
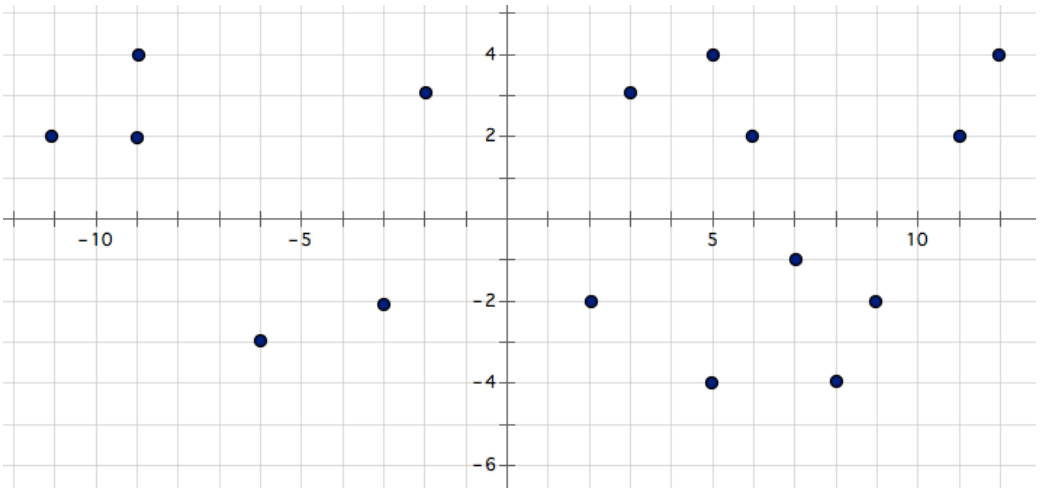


5.



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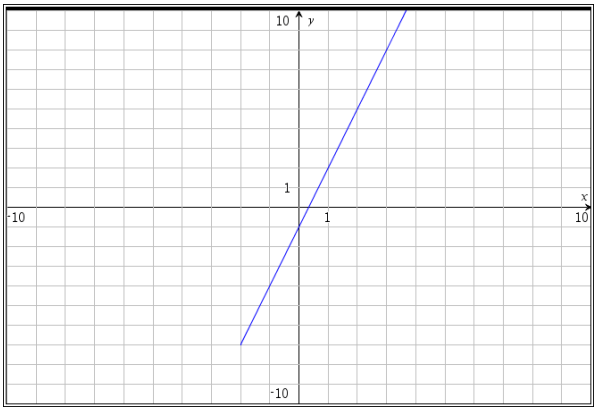
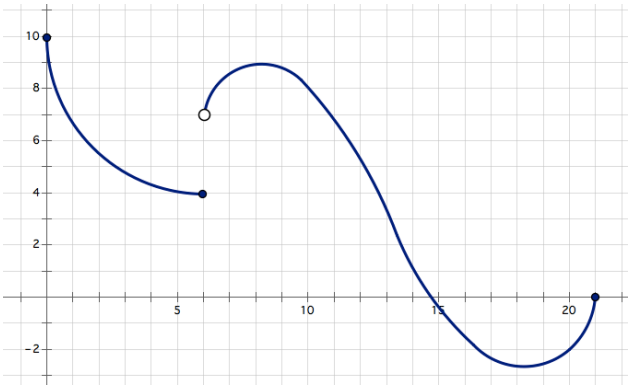


7.



The following represents a continuous function defined on the interval from [0, 6].

x	*f(x)*
0	2
1	-3
2	0
3	2
4	6
5	12
6	20

8. Determine the domain, range, x and y intercepts.
9. Based on the table, identify the minimum value and where it is located

The following represents a discrete function defined on the interval from [1,5].

x	*f(x)*
1	4
2	10
3	5
4	8
5	3

10. Determine the domain, range, x and y intercepts.
11. Based on the table, identify the minimum value and where it is located.

Describe the key features for each situation.

12. The amount of daylight dependent on the time of year.

13. The first term in a sequence is 36. Each consecutive term is exactly $1/2$ of the previous term.

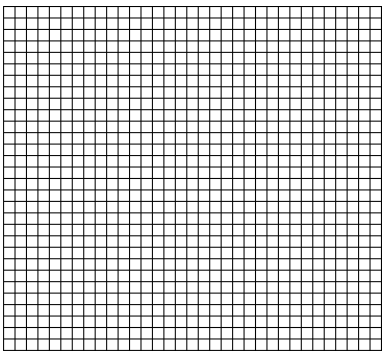
14. Marcus bought a \$900 couch on a six months, interest free payment plan. He makes \$50 payments to the loan each week.

15. The first term in a sequence is 36. Each consecutive term is $1/2$ less than the previous term.

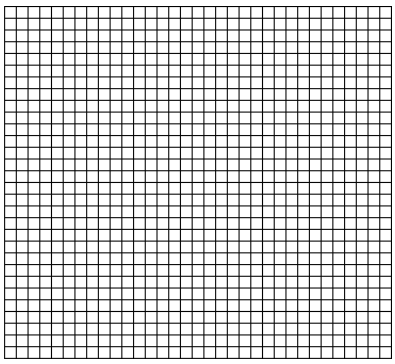
16. An empty 15 gallon tank is being filled with gasoline at a rate of 2 gallons per minute.

For each equation, sketch a graph and show key features of the graph.

17. $f(x) = -2x + 4, when\ \ x \geq 0$



18. $g(x) = 3^x$



5.3 Features of Functions – Teacher Notes

A Practice Understanding Task

Special Note to Teachers: (only if needed)

Purpose: This task is designed for students to practice interpreting key features of functions using graphs, a table of values, and situations. The key features of this task include students:

- Applying their knowledge to interpret key features of functions
- Practicing writing the domain of a function
- Comparing discrete and continuous situations
- Graphing linear and exponential equations and describing key features of the graph

Core Standards Focus:

F.IF.4 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*⋆

F.IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.

Related Standards: F.IF.1, F.IF.3

Launch (Whole Class):

Students should be able to get started on this task without additional support, since it is similar in nature to the work they did on "Getting Ready for a Pool Party" and "Floating Down the River". This would be a good task to have students do in pairs.

Explore (Small Group):

Monitor students to make sure they are accurately answering the questions about the features of functions. If they are only writing down one or two features, ask them what other features they notice. This is a good task to have students justify their answer to their partner as they go through the task. If students are incorrect in their thinking, be sure to redirect their thinking. As you monitor, make note of the areas where students are struggling to highlight these misconceptions in the whole group discussion.

Discuss (Whole Class):

Since this is a Practice Task, the discussion should include going over problems that seem to be common issues as well as problems that drive home the standards. To start the whole group discussion, choose a student to go over all of the features of one of the graphs to make sure the proper vocabulary and corresponding features are shown. Use this example to then go over features that are still confusing for students.

The goal of this whole group discussion is that ALL students can interpret key features of graphs and tables and determine the domain of a function.

Aligned Ready, Set, Go: Features 5.3