LESSON MAKER PRO

Function Type Detectives

Use rules, tables, and graphs to identify function families.

HIGH SCHOOL · MA.912.F.1.1

MA.912.F.1.1 "Given an equation or graph that defines a function, determine the function type. Given an input-output table, determine a function type that could represent it."

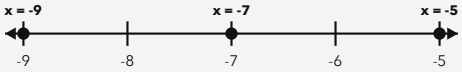
NAME _____ DATE _____

SPOT THE PATTERN

A linear function has a constant rate of change. An exponential function has a constant factor between outputs for equal input changes. A quadratic graph makes a parabola, while other families have their own recognizable rules or shapes.

WORKED EXAMPLE

The marked values on the input axis are used in f(x) = 5x + 12. Determine the function type.



1. The marked inputs increase by 2 each time.
2. f(-9) = -33 and f(-7) = -23, so the outputs increase by 10.
3. The rate of change is 10/2 = 5, which is constant.

Answer: linear function

PRACTICE 6 problems

1 Determine the function type of y = -3x + 8.

ANSWER _____

2 Determine the function type of $y = x^2 + 4$.

ANSWER _____

3 Determine the function type of $y = 6(2^x)$.

ANSWER _____

4 Determine the function type of y = |x - 1| + 3.

ANSWER _____

5 Determine the function type of y = (x - 4)(x + 1).

ANSWER _____

6 Determine the function type of $y = 2x^3 - x$.

ANSWER _____

APPLY IT Show your work

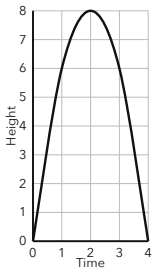
1 A gaming creator tracks the number of followers gained after each month of posting. Based on the table, determine a function type that could represent the relationship. Give one reason from the table.

GAMING CHANNEL FOLLOWERS

Months, x	Followers, y
0	4
1	16
2	64
3	256

ANSWER _____

2 A student records the height of a skateboard above a ramp during one jump. Based on the graph, determine the function type that models the height.



ANSWER _____

CHALLENGE One step up

Function A has an output of 2 when x = 0. Each time x increases by 1, its output increases by 6. Function B also has an output of 2 when x = 0. Each time x increases by 1, its output is multiplied by 6. Write a rule for each function and identify each function type. Explain how the two patterns differ.

WORK SPACE AND ANSWER

ANSWER KEY

Function Type Detectives

HIGH SCHOOL · MA.912.F.1.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Determine the function type of $y = -3x + 8$.	**linear function**
2	Determine the function type of $y = x^2 + 4$.	**quadratic function**
3	Determine the function type of $y = 6(2^x)$.	**exponential function**
4	Determine the function type of $y = \|x - 1\| + 3$.	**absolute value function**
5	Determine the function type of $y = (x - 4)(x + 1)$.	**quadratic function**
6	Determine the function type of $y = 2x^3 - x$.	**cubic function**

PART 2 · APPLY IT

1. **exponential function; for each increase of 1 month, the number of followers is multiplied by 4.** Compare consecutive outputs. The outputs have a constant multiplicative factor of 4, so an exponential function could represent the data.
2. **quadratic function** The graph is a downward-opening parabola. A parabola is the graph of a quadratic function.

CHALLENGE

Function A: $y = 6x + 2$, linear function. Function B: $y = 2(6^x)$, exponential function. Function A adds 6 for each increase of 1 in x, while Function B multiplies by 6.

Accept equivalent descriptions such as linear, quadratic, exponential, absolute value, and cubic without the word function. For the challenge, accept $y = 2 + 6x$ for Function A and $y = 2 \cdot 6^x$ for Function B.