

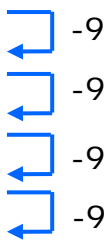
Comparing Linear and Exponential Functions - Guided Lesson Explanation**Explanation#1**

Since the x-values in the table are consecutive, you can compare successive y-values to determine which type of function the table describes.

You can test whether a function is linear by finding the differences between successive y- values, which are called the first differences. If the first differences are all equal, the function is linear.

Find the first differences in the table.

x	y
-4	45
-3	36
-2	27
-1	18
0	9

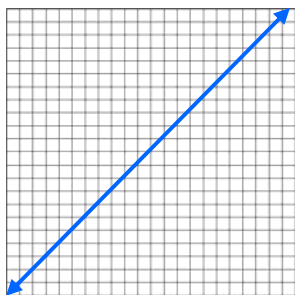


The diagram shows four blue arrows pointing from the y-value of one row to the y-value of the row below it. Each arrow is labeled with the number -9, indicating that the first differences are constant.

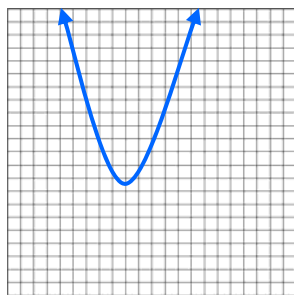
Since the first differences all -9. The function is linear.

Explanation#2

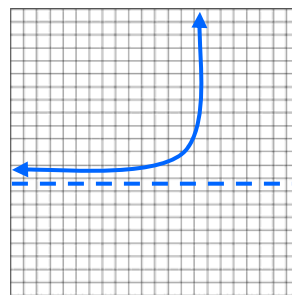
We need to refresh our memory about the three types of functions- linear, quadratic and exponential.



Linear



Quadratic



Exponential



Name _____

Date _____

The graph of a linear function is a straight line. The given graph is straight line, so it is linear. The graph of a quadratic function is a parabola that opens up or down. The given graph does not approach a parabola that opens downwards, so it is not quadratic. The graph of an exponential function has one horizontal asymptote. The given graph does not approach a horizontal asymptote, so it is not exponential.

The given graph shows a quadratic function.

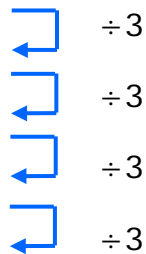
Explanation#3

Since the x-values in the table are consecutive, you can compare successive y-values to determine which type of function the table describes.

You can test whether a function is linear by finding the differences between successive y- values, which are called the first differences. If the first differences are all equal, the function is linear.

Find the first differences in the table.

x	y
-4	243
-3	81
-2	27
-1	9
0	3



Since the first differences all are $\div 3$. The function is linear. The graph of a linear function is a straight line. This function is a parabola; not a straight line.

