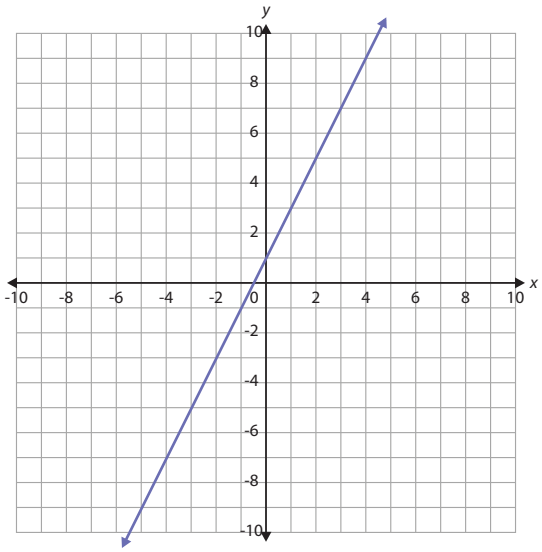
Name _____ Date _____

Linear vs. Nonlinear: Graphs and Equations

If a function has a constant rate of change, it is a **linear function**. The graph of a linear function will be a straight line. Linear equations can be written in the form $y = mx + b$.

Here is a graph of a linear function and its equation:

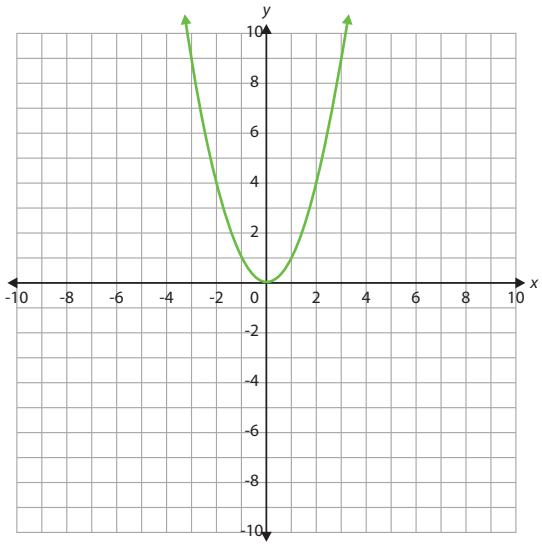
$$y = 2x + 1$$



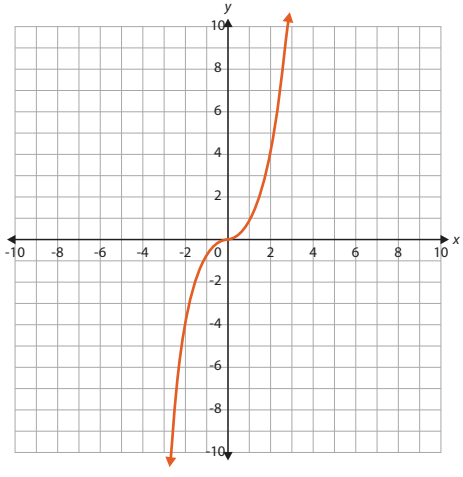
If a function does **not** have a constant rate of change, it is a **nonlinear function**. The graph of a nonlinear function will not be a straight line. Nonlinear equations cannot be written in the form $y = mx + b$.

Here is a graph of a nonlinear function and its equation:

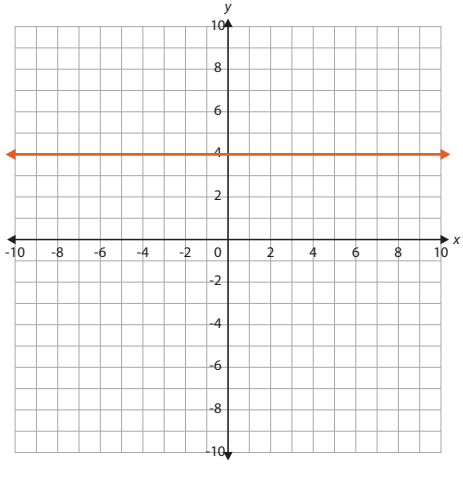
$$y = x^2$$



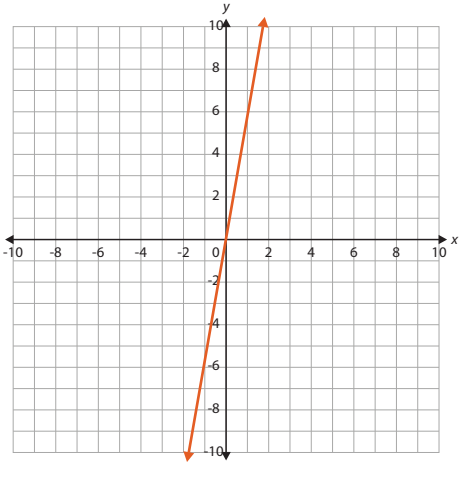
Determine whether each graph shows a linear or nonlinear function. Circle the correct answer.



Linear Nonlinear



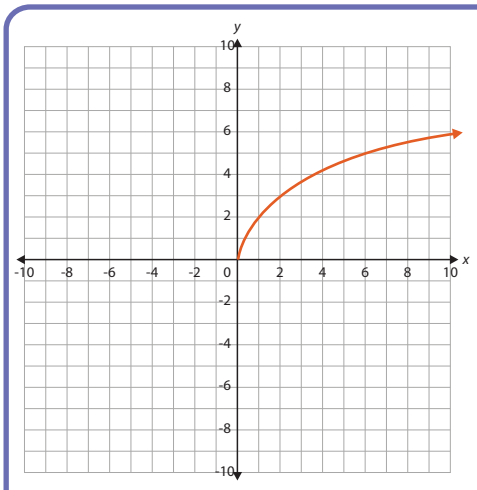
Linear Nonlinear



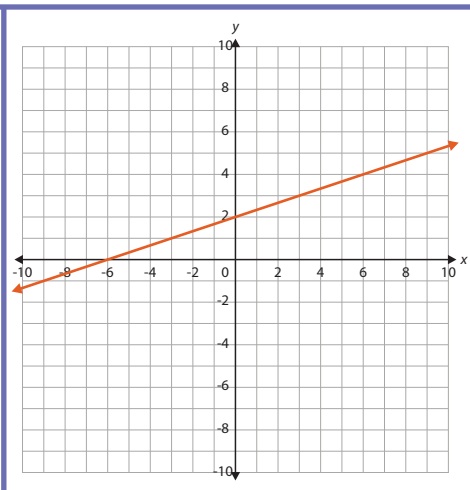
Linear Nonlinear

Linear vs. Nonlinear: Graphs and Equations

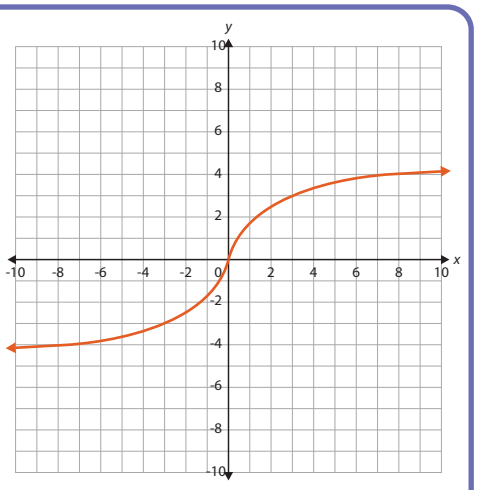
Keep going! Determine whether each graph shows a linear or nonlinear function. Circle the correct answer.



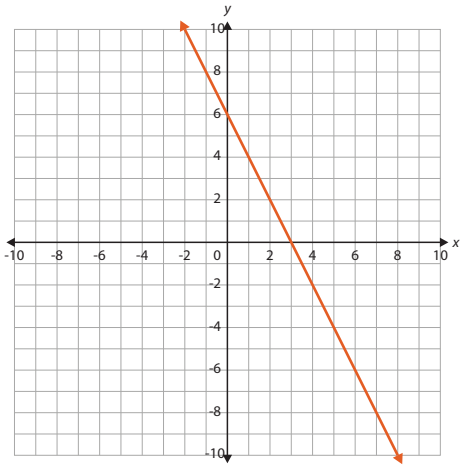
Linear Nonlinear



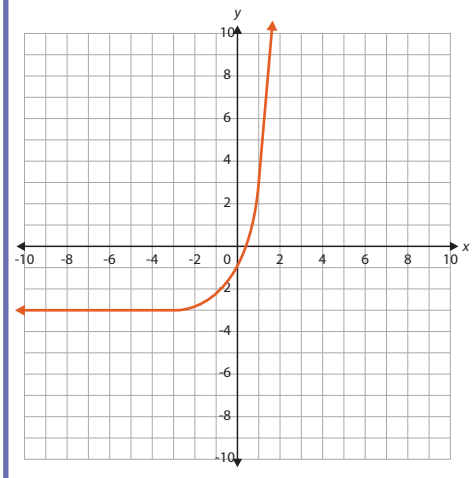
Linear Nonlinear



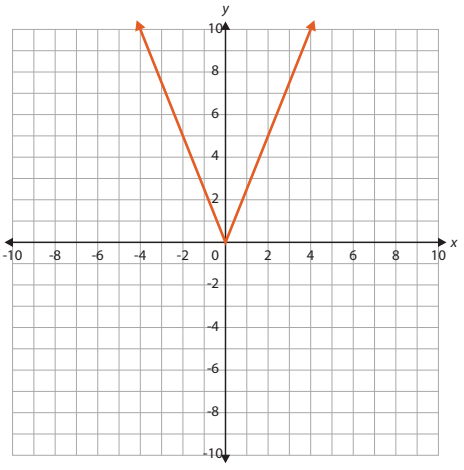
Linear Nonlinear



Linear Nonlinear



Linear Nonlinear



Linear Nonlinear

Determine whether each equation shows a linear or nonlinear function. Circle the correct answer.

$y = x + 9$	$y = 3x^2$	$y = -\frac{1}{2}x$
Linear Nonlinear	Linear Nonlinear	Linear Nonlinear
$y = 4x^2 + 7$	$4x + 2y = 10$	$y = 6x^3 - 5x$
Linear Nonlinear	Linear Nonlinear	Linear Nonlinear