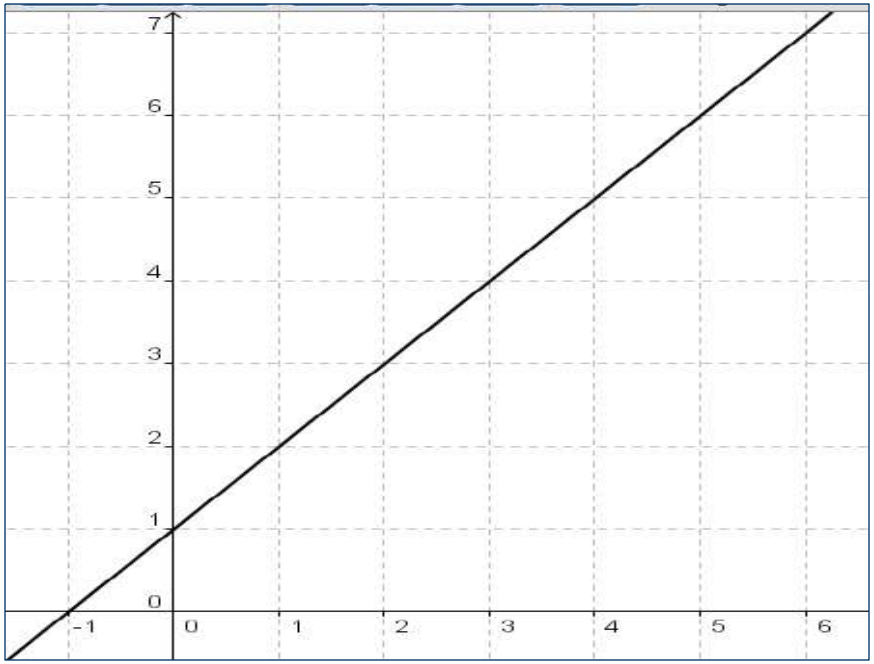
Linear and Nonlinear Functions

Identifying functions
on tables, graphs, and equations.

Warm Up

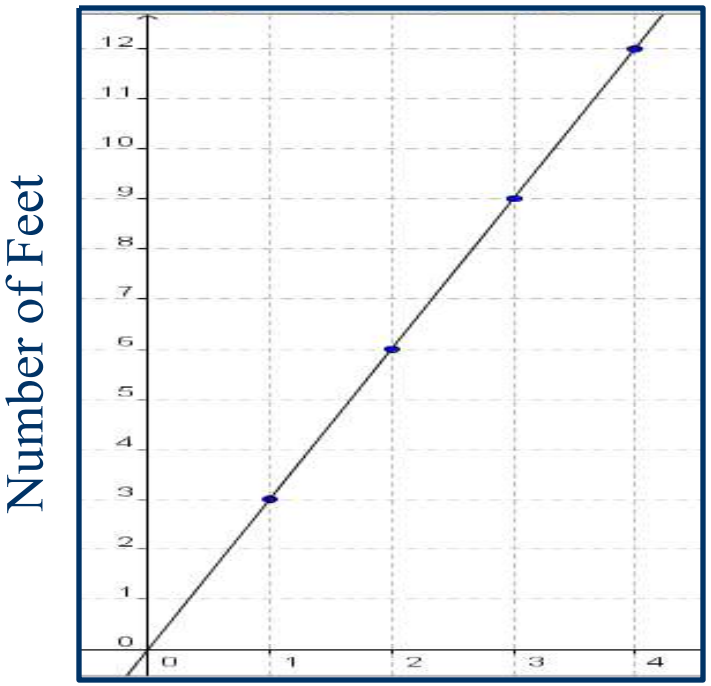
- Graph $y = 2x + 1$
- Rewrite the linear equation $3y + x = 9$ to its slope-intercept form or the "y = " form.

What is the linear equation for this graph?

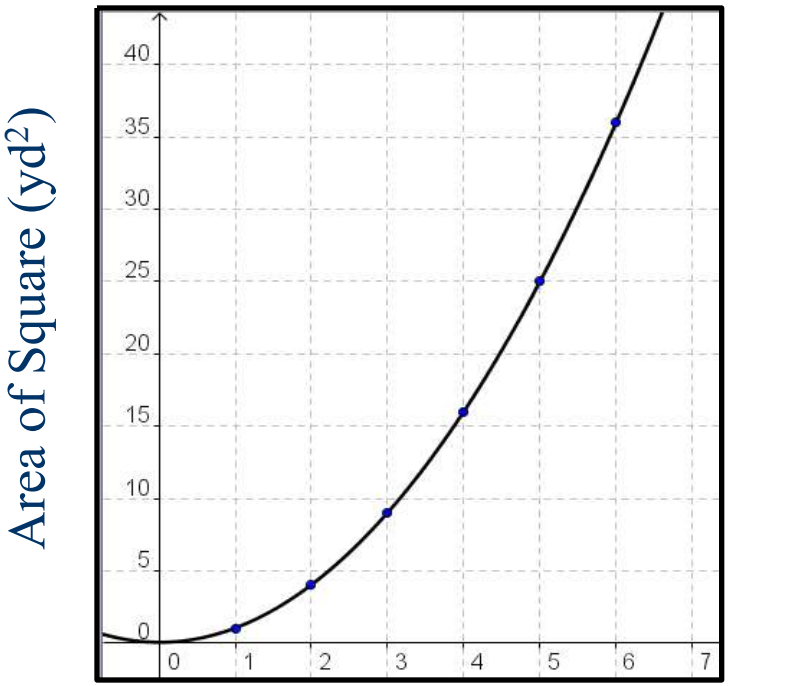


Linear vs. Nonlinear

Yards to Feet



Yards to Square Yards



Tables: Linear or Nonlinear

Is the rate of change constant (the same)?

	x	y	
	2	50	
+2			-15
	4	35	
+2			-15
	6	20	
+2			-15
	8	5	

- **linear**

	x	y	
	1	1	
+3			+15
	4	16	
+3			+33
	7	49	
+3			+51
	10	100	

- **nonlinear**

Identify: Linear or Nonlinear Table?

x	y
0	20
5	16
10	12
20	4

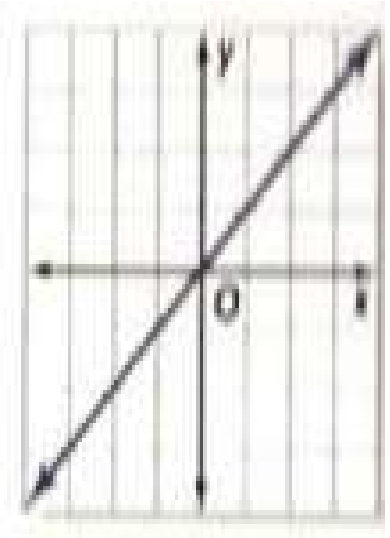
- **linear**

x	0	2	4	6
y	0	2	8	18

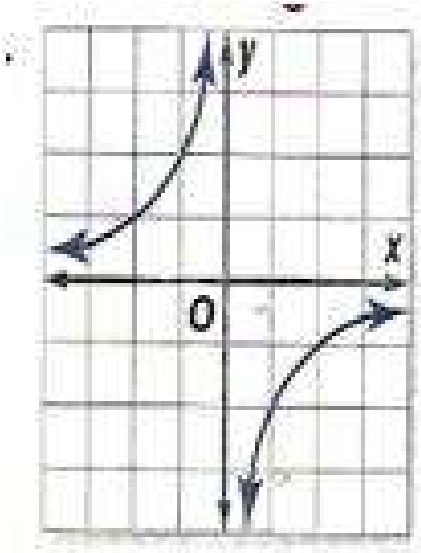
nonlinear

Graphs: Linear or Nonlinear

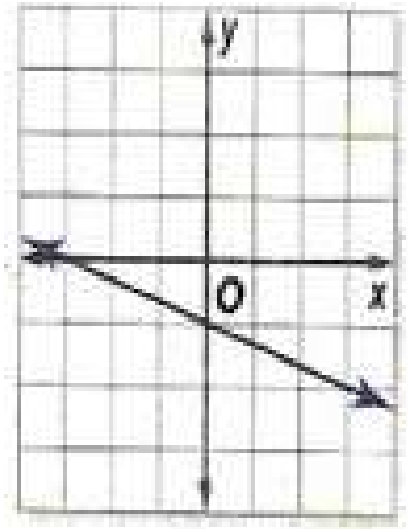
Is the graph a straight line?



linear



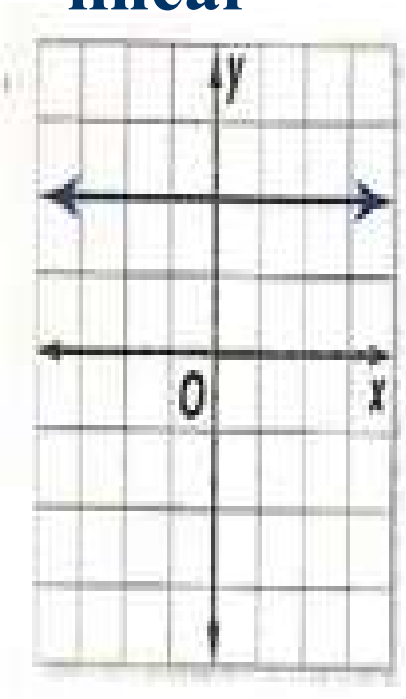
nonlinear



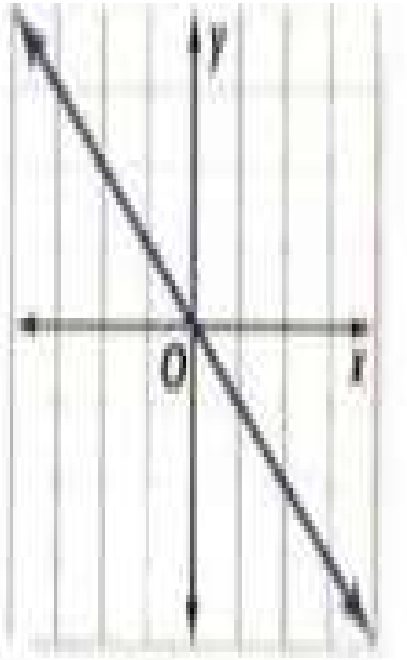
linear

Identify: Linear or Nonlinear Graph?

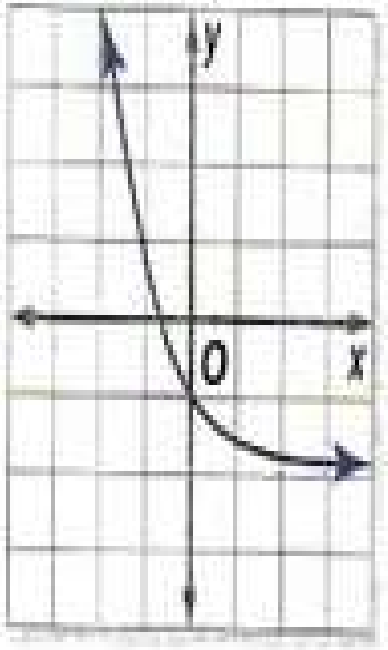
linear



linear



nonlinear



Equations: Linear or Nonlinear

REMEMBER THESE 3 THINGS:

x or y can NOT appear in the denominator. Both must be in the numerator!!

x and y can NOT be multiplied together (no mushing).

x or y can NOT have an exponent other than a 1 or a 0.

Identify:Linear or Nonlinear Equation?

$y = x + 4$	$y = 6/x$	$y = \frac{1}{2} x$	$y = x^3 + 1$	$y = 4$
linear	nonlinear	linear	nonlinear	linear

$y = .6x^1$	$y = x^2 + 8$	$y = \frac{3x}{2} + 1$	$y = 2/x + 5$
linear	nonlinear	linear	nonlinear

Pointers to Keep in Mind

A table is linear if the rate of change is constant.
There is a common difference.

- A graph is linear if it is a straight line.

An equation is linear if the power of x or y is either 1 or 0 and they appear in the numerator and they are not multiplied together.

Exit Slip

Identify if linear or nonlinear.

Table A

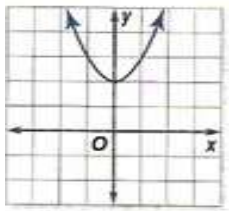
x	3	6	9	12
y	12	10	8	6

Equation

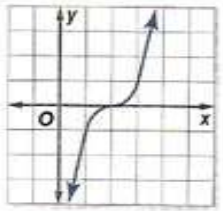
$$\mathbf{y = \frac{8}{x} + 5}$$

Graph

a



b



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