

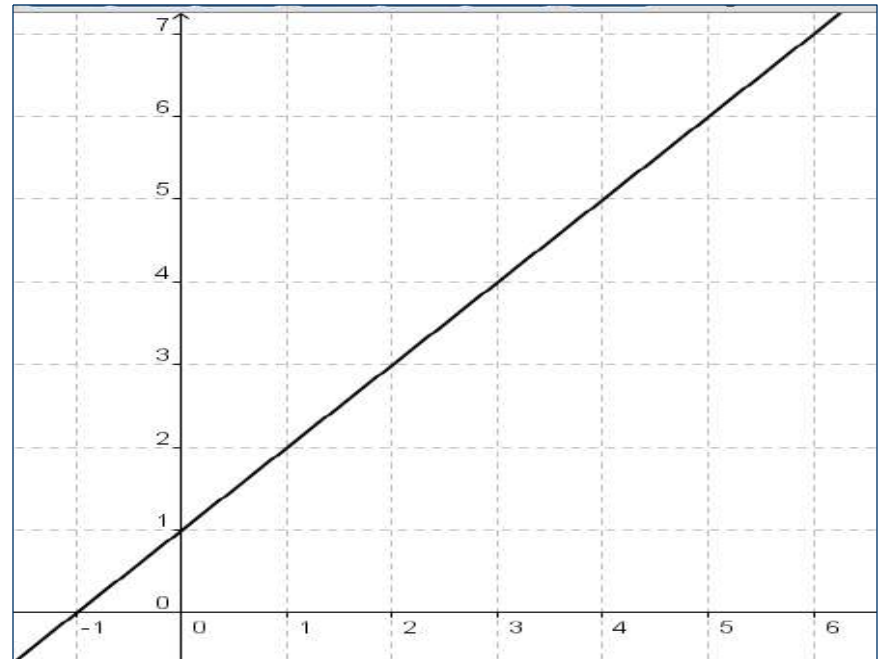
Linear and Nonlinear Functions

Identifying functions
on tables, graphs, and equations.

Warm Up

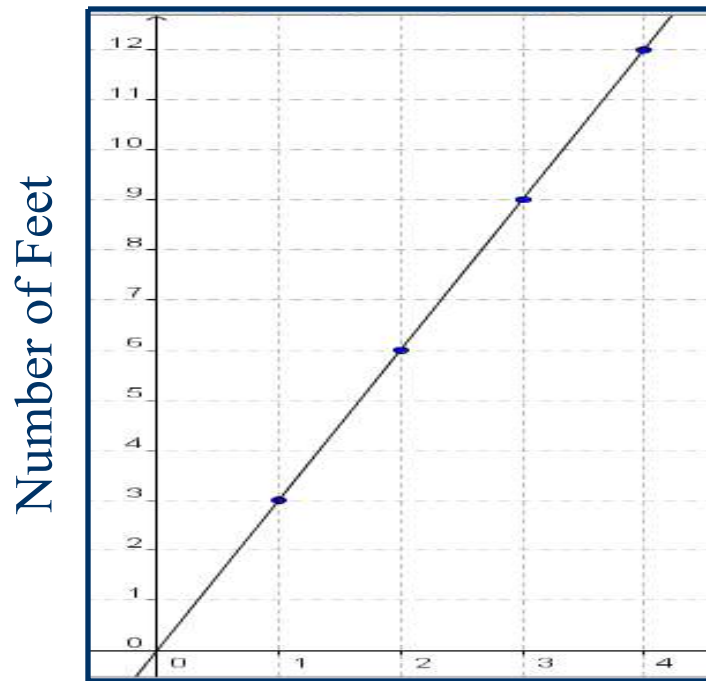
- ◆ Graph $y = 2x + 1$
- ◆ Rewrite the linear equation $3y + x = 9$ to its slope-intercept form or the “ $y =$ ” form.

What is the linear equation for this graph?



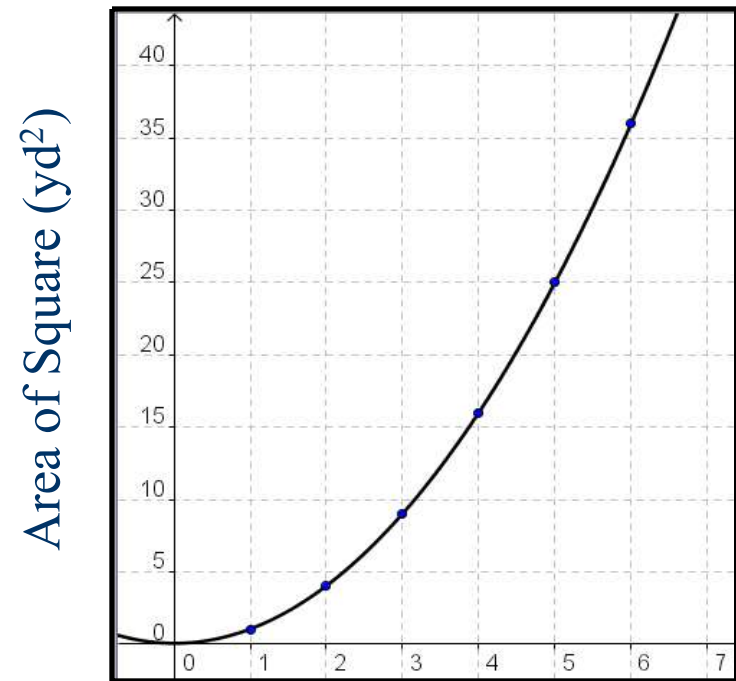
Linear vs. Nonlinear

Yards to Feet



Number of Yards

Yards to Square Yards



Length of a Side of a Square Yard

Tables: Linear or Nonlinear

Is the rate of change constant (the same)?

x	y
2	50
4	35
6	20
8	5

The diagram shows a table with two columns, x and y. The x values are 2, 4, 6, and 8. The y values are 50, 35, 20, and 5. On the left side, three curved arrows point downwards between the rows, each labeled '+2', indicating the change in x. On the right side, three curved arrows point downwards between the rows, each labeled '-15', indicating the change in y.

◆ **linear**

x	y
1	1
4	16
7	49
10	100

The diagram shows a table with two columns, x and y. The x values are 1, 4, 7, and 10. The y values are 1, 16, 49, and 100. On the left side, three curved arrows point downwards between the rows, each labeled '+3', indicating the change in x. On the right side, three curved arrows point downwards between the rows, labeled '+15', '+33', and '+51' respectively, indicating the change in y.

◆ **nonlinear**

Identify: Linear or Nonlinear Table?

x	y
0	20
5	16
10	12
20	4

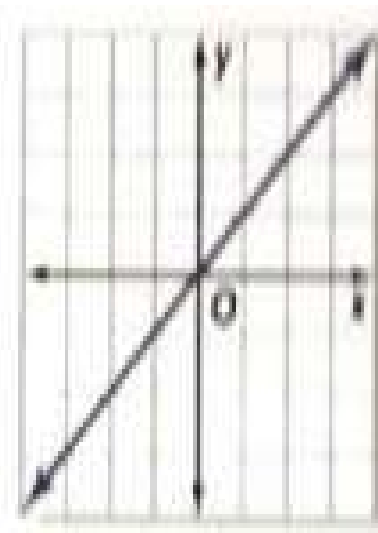
◆ **linear**

x	0	2	4	6
y	0	2	8	18

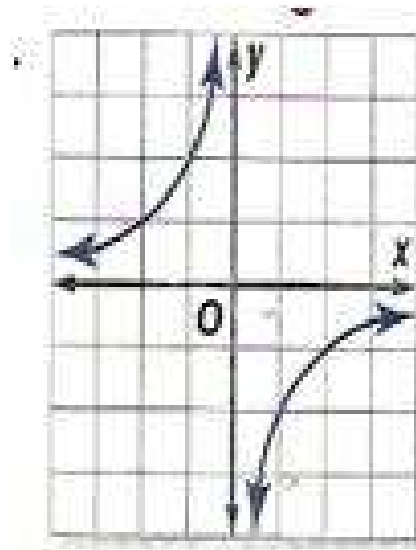
nonlinear

Graphs: Linear or Nonlinear

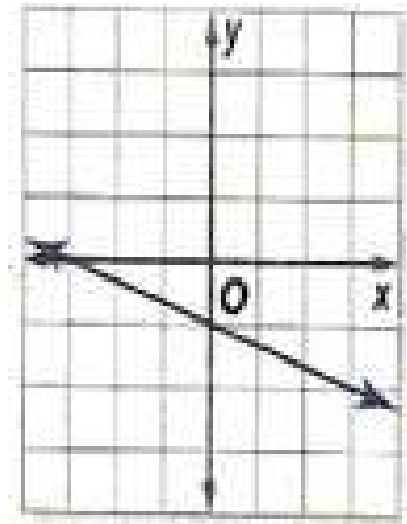
Is the graph a straight line?



linear



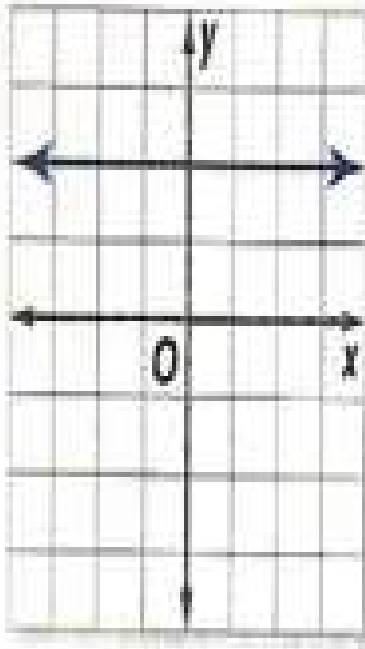
nonlinear



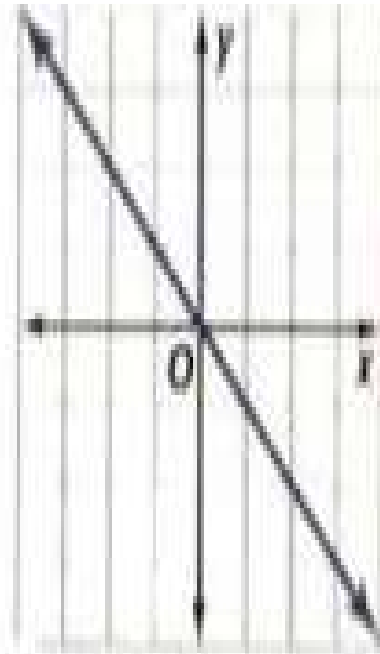
linear

Identify: Linear or Nonlinear Graph?

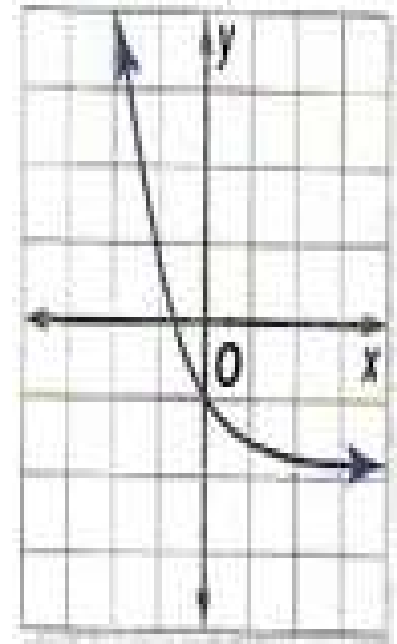
linear



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?

$$y = x + 4$$

linear

$$y = 6/x$$

nonlinear

$$y = \frac{1}{2}x$$

linear

$$y = x^3 + 1$$

nonlinear

$$y = 4$$

linear

$$y = .6x^1$$

linear

$$y = x^2 + 8$$

nonlinear

$$y = \frac{3x}{2} + 1$$

linear

$$y = 2/x + 5$$

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

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

Graph

