A <u>linear function</u> is a function with a consistent slope that makes a straight line.

Always check to see if its a function first!

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Examples

Slope: $\frac{y}{x}$

Determine if the following sets are linear functions

1. {(0, -3), (4, 0), (8, 3), (12, 6), (16, 9)}

4 4 4 4

3 3 3 3

Slope: $3/4$

Yes

2. {(-4, 13), (-2, 1), (0, -3), (2, 1), (4, 13)}

2 2

-12 -4

$\frac{-12}{2} \neq \frac{-4}{2}$

No

3. {(-3, -5), (-1, -2), (1, 1), (3, 4), (5, 7)}

2 2 2 2

3 3 3 3

Slope: $3/2$

Yes

4. {(-2, 2), (-1, 5), (0, 6), (1, 5), (2, 7)}

1 1

3 1

No

$3/1 \neq \frac{1}{1}$

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Determine if the following sets are linear functions

5.

x	-6	-3	0	3	6
y	0	2	4	6	8

3 3 3 3

2 2 2 2

Yes

6.

x	-3	-2	-1	0	-1
y	-2	0	2	4	6

No

7.

x	-9	-5	-1	3	7
y	-11	-8	-5	-2	1

4 4 4 4

3 3 3 3

Yes

8.

x	-2	-1	0	1	2
y	5	4	3	4	5

1 1 1

-1 -1 1

No

$-\frac{1}{1} = -\frac{1}{1} \neq \frac{1}{1}$

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Decide which of the following points are on the graph of the function $y=2x+1$:

$$(0,1),(2,5),(\frac{1}{2},2),(2,-1),(-1,-1),(0.5,1)$$

Find several points that are on the graph of the function $y = 2x^2 + 1$

- Plot those points on a coordinate plane. Would you consider this graph to be linear? Why or why not?

Mar 6-10:27 PM

Determining if Equations are Linear

$y = \frac{1}{2}x + 5$

Slope

What makes an equation linear?

* Slope-Intercept Form
* has a slope

What makes an equation non-linear?

* Exponents
* Dividing by a variable

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Examples:

$y = mx + b$

9. $y = x - 2$

Yes

10. $y = x^2 - 2$

No

11. $2x + y = 6$

$-2x \quad -2x$

$y = 6 - 2x$

Yes

12. $x = y^2 + 4$

No

13. $\frac{3}{x} + 2y = 4$

$-2y \quad -2y$

$\frac{3}{x} = 4 - 2y$

$-4 \quad -4$

$\frac{\frac{3}{x} - 4}{-2} = \frac{-2y}{-2}$

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

No

$y = mx + b$

14. $\left(x = \frac{y}{4} - 2\right)4$

$4x = y - 8$

$+8 \quad +8$

$4x + 8 = y$

Yes

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