Edgenuity

Warm-Up | Linear vs. Nonlinear Functions

Lesson Question

Lesson Goals

Use graphs and tables to determine whether a function has a constant rate of change.

Identify _____ functions.

Identify _____ functions.

Words to Know

Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.

_____	display	A. to explain in understandable terms; to understand according to personal beliefs
_____	rate of change	B. a function that can be written in the form $y = mx + b$, where m and b are real numbers; consists of a set of ordered pairs all lying on the same line
_____	linear function	C. in a function, the ratio of the change in the dependent value with respect to the change in the independent value
_____	interpret	D. to put in view or make evident

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Instruction | Linear vs. Nonlinear Functions

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Finding the Rate of Change

The **rate of change** is the change in one quantity with respect to another quantity.

Use the table to **interpret** the rate of change.

Change in input $\square - 2 = 1$

Change in output $165 - 110 = 55$

Rate of change $= \frac{55}{1} = \square$

x	*y*
2	110
3	165
4	220
5	275

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Linear vs. Nonlinear Functions

Linear function → **Has a constant ☐ of change**

Nonlinear function → **☐ have a constant rate of change**

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Recognizing Rate of Change from Tables

EXAMPLE

This table **displays** the approximate height and distance traveled by a soccer ball that was kicked across a field.

Write whether each column represents a function that is nonlinear or linear.

Time (s)	Height (yd)	Length (yd)
0	0	0
+ 1	+ 5.3	+ 17
1	5.3	17
+ 1	+ 2.7	+ 17
2	8	34
+ 1	+ 1.8	+ 17
3	9.8	51

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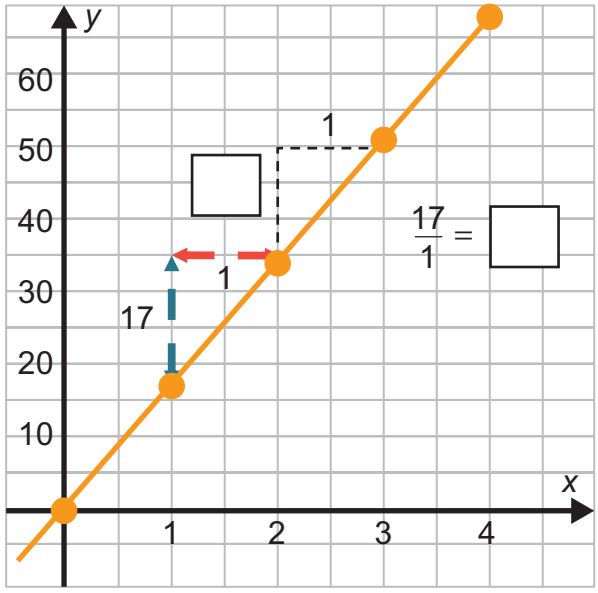
Rate of Change from a Graph

EXAMPLE

This shows the length and height traveled by a soccer ball.

Time (s)	Height (yd)	Length (yd)
0	0	0
1	5.3	17
2	8	34
3	9.8	51
4	7.7	68



So since we have a [ ] rate of change, that tells us that this graph shows a linear function.

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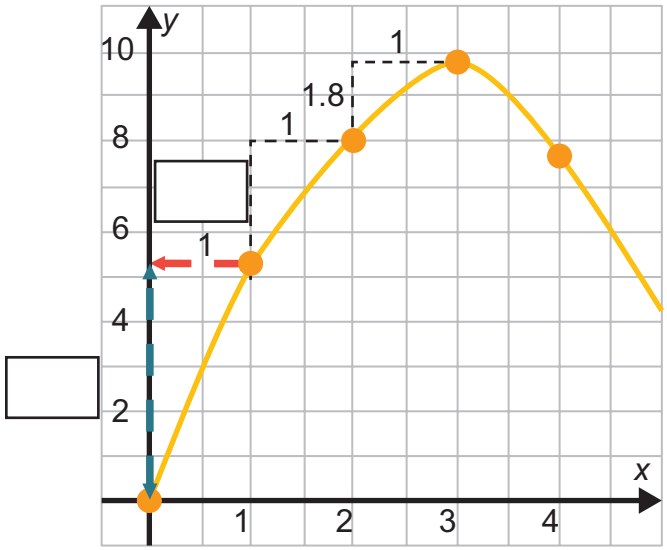
Finding the Rate of Change from a Graph

EXAMPLE

This shows the length and height traveled by a soccer ball.

Time (s)	Height (yd)	Length (yd)
0	0	0
1	5.3	17
2	8	34
3	9.8	51
4	7.7	68



Since these rates are [ ] constant, this is considered a [ ] function.

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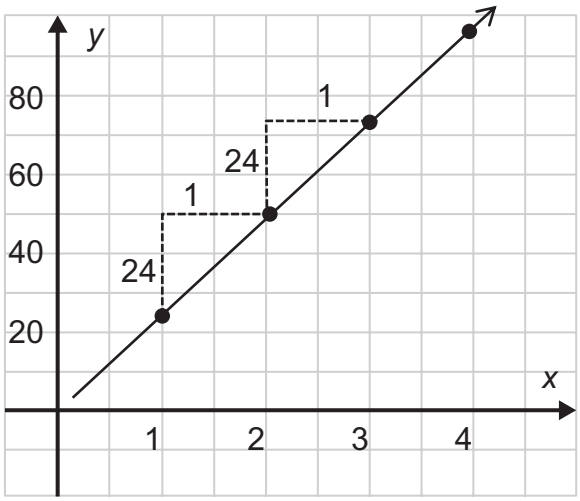
Linear and Nonlinear Functions in Real-World Situations

REAL-WORLD CONNECTION

There are 24 hours in one day. The total hours is a function of the days. Does this situation represent a linear or nonlinear function?

Complete the table.

Days	Hours
1	
2	
3	
4	



There is a _____ rate of change. This confirms a _____ relationship or function between days and hours.

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Summary | Linear vs. Nonlinear Functions

Lesson Question	What is the difference between linear and nonlinear functions?

Answer

Use this space to write any questions or thoughts about this lesson.

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