

Rate of Change

Slide 2 - Text Response	Your Response
<p>Bell work – 8/16/2016</p> <ul style="list-style-type: none"> • Given: (1, -19), (-2, -7). • Find the slope of the line passing through these coordinate points. • What is the y-intercept? • Find the equation for the line. 	

Slide 3 - Text Response	Your Response
<p>Review System of Equations</p> <ul style="list-style-type: none"> • A farm raises a total of 220 chickens and pigs. The number of legs of the stock in the farm totals 520. How many chickens and pigs are at the farm? • Write an equation representing the total of chicken and pig. • Write an equation representing the total number of legs for chicken and pig. 	

Slide 4 - Text Response	Your Response
<p>Review System of Equations</p> <ul style="list-style-type: none"> • Solve the system of equations to find how many chicken and pigs in the farm. <p>Number of chicken: _____</p> <p>Number of pigs: _____</p>	

Slide 7

Rate of change is often used when speaking about momentum. It is generally expressed as a ratio between a change in one variable relative to a corresponding change in another. Rate of change (average rate of change) is constant. Algebraically, the rate of change is represented by the slope of a line.

Slide 8 - Drawing

Your Response

Rate of Change

- What are the ways to represent the rate of change?
- How do you express the slope of the line?

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Rate of Change : Word Problem

Example 1

- A climber is on a hike. After 2 hours he is at an altitude of 400 feet. After 6 hours, he is at an altitude of 700 feet. What is the average rate of change?
- Identify the type of change and record the values.
- Apply the slope formula and calculate the rate of change.

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Rate of Change: Word Problem

- Change in altitude over time.
- (2, 400) and (6, 700)
-
- $m =$
-
- Average rate of change is ____ per ____.

Slide 11 - Text Response

Your Response

Rate of Change

- How would you predict the altitude after hiking for 10 hours?

Slide 12 - Text Response

Your Response

Rate of Change : Word Problem

Example 2

- A scuba diver is 30 feet below the surface of the water 10 seconds after he entered the water and 100 feet below the surface after 40 seconds. What is the scuba divers rate of change?
- Type of change?
- Slope?

Rate of Change: Word Problem

Practice 1

- A rocket is 1 mile above the earth in 30 seconds and 5 miles above the earth in 2.5 minutes. What is the rockets rate of change in miles per second? What about miles per minute.

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Rate of Change: Table of Value

Example 3

- Find the Average Rate of Change from a Table
- The table below defines the relationship $y = f(x)$

x	0	2	4	5
f(x)	26	17	5	1

- Find the average rate of change of f with respect to x over $[0, 4]$.

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Rate of Change: Table of Value

x	0	2	4	5
f(x)	26	17	5	1

$$\frac{\text{change of } f}{\text{change of } x} = \frac{f(4) - f(0)}{4 - 0}$$

Slide 16 - Text Response

Your Response

Rate of Change: Table of Values

Practice 2

- The average price for a ticket to a movie theater in North America for selected years is shown in the table below.

Year	1987	1991	1995	1999	2003	2007
Price	3.91	4.2	4.35	5.06	6.03	6.88

- Find the rate of change over the interval [2, 5].

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Rate of Change: Arithmetic Sequence

- When you have a constant rate of change at every interval, it is called a **common difference** of an **arithmetic sequence**.
- It is called **common difference** because it is the same number between each number in the sequence.

Slide 18 - Text Response

Your Response

Arithmetic Sequence: Common Difference

Table 1

x	y	difference of y-values
-2	-4	-1 + 4 = 3
-1	-1	
0	2	2 + 1 = 3
1	5	5 - 2 = 3
2	8	8 - 5 = 3

Table 2

Cars Washed	
Number	Money (\$)
5	40
10	80
15	120
20	160

What is the common difference? ___!

Slide 19 - Multiple Choice

Your Response

Arithmetic Sequence: Common Difference

What is the common difference? _____!

Temperature	Ice Cream Sales
85	\$200
71	\$160
84	\$170
66	\$120
77	\$120
75	\$180
68	\$100
91	\$230

Available Choices:

- 40
- 10
- 50
- 20
- 0
- There is no common difference

Slide 20 - Text Response

Your Response

Arithmetic Sequence: Common Difference

Find the common difference from these tables of value if any.

x	y
0	3
1	8
2	13
3	18
4	23

x	y
0	3
1	15
2	75
3	375
4	1,875

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Rate of Change: Video

- [Average Rate of Change](#)

Example 4

- For $f(x) = x^2 - 2$, find the rate of change on the interval $[-2, 4]$.