

applications of exponentials

agenda

WARM-UP

NOTES (P.123)

EXIT TICKET

HW: PRACTICE
(1 PAGE)

reminders

TEST
THURSDAY

HW 6.2 DUE FRIDAY

UNIT 9 TEST
CORRECTIONS DUE
THURSDAY

SUPER SATURDAY

warm-up monday

A table of values for the exponential function f is shown below.

x	$f(x)$
1	140,000
2	143,850
3	147,806
4	151,871
5	156,047

↑
+3850

Which situation could describe this function?

- ☒ A The value of a house increases by approximately $2\frac{3}{4}\%$ per year.
- ☐ B The value of a house increases by \$3,850 per year.
- ☐ C The value of a house decreases by approximately $2\frac{3}{4}\%$ per year.
- ☐ D The value of a house decreases by \$3,850 per year.

quiz statistics

averages

2ND - 87

3RD - 84 *4 MISSING

4TH - 79 *3 MISSING

5TH - 89 *5 MISSING

7TH - 75 *7 MISSING

REMEMBER: IF YOU DO BETTER ON
YOUR UNIT 10 TEST, I WILL RAISE THE
GRADE ON THE QUIZ

ZEROES IN GRADEBOOK = YOU ARE
PROBABLY NOT PASSING

UNIT 9 TEST CORRECTIONS DUE
THURSDAY 9AM

TUTORING THIS WEEK:

TUES AM/PM

WED AM/PM a-lunch

THURS AM

EXTRA CREDIT POSTERS DUE THURSDAY.
DO A CRAPPY JOB = GET A CRAPPY GRADE.

P-123

Part 1: Your Rich Aunt Rhoda

Imagine that when you were born, your rich Aunt Rhoda wanted to provide for your future. She offered your parents two options:

Option 1

She would give you \$1000 for every birthday until you are sixteen.

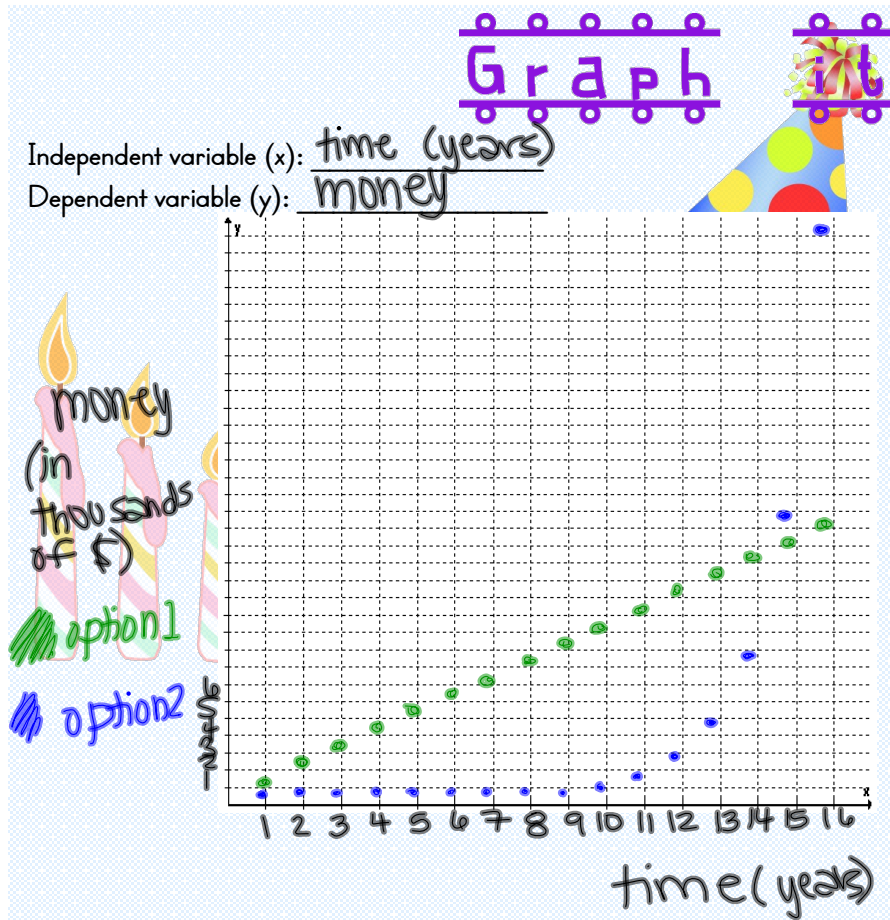
Option 2

She would give you \$1 for your first birthday and then double the amount you have on your second birthday so that you have \$2. On your third birthday, she would double the amount received at the last birthday. She will continue doubling the amount until you are sixteen.

Which option would you choose?

Birthday	Process	Total Amount for Option 1
1		1000
2	1000+1000	2000
3	2000+1000	3000
4	3000+1000	4000
5		5000
6		6000
7		7000
8		8000
9		9000
10		10000
11		11000
12		12000
13		13000
14		14000
15		15000
16		16000

Birthday	Process	Total Amount for Option 2
1		1
2	1(2)	2
3	2(2)	4
4	4(2)	8
5	8(2)	16
6	16(2)	32
7	32(2)	64
8		128
9		256
10		512
11		1024
12		2048
13		4096
14		8192
15		16384
16		32768



3. Write equations that represent the relationship between years and money for Option 1 and Option 2.

option 1

Linear

$$y = \frac{100}{1}x + \frac{0}{b}$$

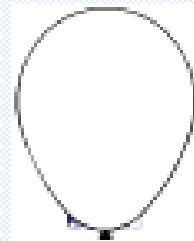
$$\boxed{y = 100x}$$

option 2

Exp.

$$y = (-.5) \cdot 2^x$$

y-int mult.



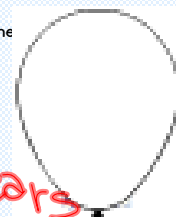
4. Based on the information in the table and graph, would you change your decision about which Option you preferred? If so, explain why?



5. option 1 If you only received money for ten years, which option would give you the most money?

6. between 14 & 15 years How many years would it be before you had the same amount of money with both options?

7. year 13 When did the money in Option 2 begin to increase rapidly? Explain why this happens



15 years

8. When did it become obvious that one option was better than the other? _____

applications of exponentials

DUE BEFORE YOU LEAVE.

WORK INDEPENDENTLY; DO NOT LEAVE BLANKS! YOU
MAY USE YOUR NOTES.**EXIT TICKET**

Name: _____

Part II: The Science Experiment

A scientist is conducting an experiment with an antibiotic on a colony of bacteria. The antibiotic he introduces kills 2% of the bacteria colony each hour. The amount of bacteria remaining each hour can be represented by the equation $y = 1,000,000 \cdot (0.98)^x$.

1. What does 1,000,000 represent in this equation?
2. How was the (0.98) derived for this equation?
3. Graph the equation in your graphing calculator. Is this situation a growth or a decay? How do you know?
4. How many bacteria will there be left in 8 hours? _____
5. How many bacteria will there be left in 24 hours? _____
6. How long will it be before the scientist will have half the beginning amount of bacteria? _____

front page

Algebra I – Unit 10: Topic 1 – Applications of Non-Linear, Non-Quadratic Functions

Practice – Applications of Non-Linear, Non-Quadratic Functions

pp 781-788

Name _____

Date _____

Pd. _____

1. In 2009, a large company decides to build a manufacturing plant in the town of Tiny, Texas with 1400 residents. Due to the increase in jobs available with this company, the population of Tiny, Texas increase 9% each year. This growth is represented by the equation $y = 1400 \cdot (1.09)^x$.
 - A. Approximately when would the population of Tiny, Texas double?
 - B. A new fast food restaurant is considering a franchise in Tiny, Texas. Based on market research, it is a better financial investment when the town has a population of at least 4000. If the growth of Tiny, Texas continues, in what year should the fast food restaurant open in this town?
2. The MSRP price of a 2011 Cadillac Escalade is \$63,160. The vehicle depreciates in value by 8% each year. This depreciation is represented by the equation $y = 63160 \cdot (0.92)^x$.
 - A. What is its value 6 years after it is purchased?
 - B. Will the car ever have a value of zero dollars?
3. The population fish in a pond is decreasing at a rate of 1% per year. In 2000, there were 1300 fish in this pond. This decay can be represented by the equation $y = 1300 \cdot (0.99)^x$.
 - A. What is the population of fish in 2008?
 - B. Between which two years will the population of fish be half of what it was in 2000?
4. Annual sales for a small childrens' clothing company are \$149,000 and increase at a rate of 6% per year. This growth is represented by the equation $y = 149,000 \cdot (1.06)^x$.
 - A. Explain why the base of the exponent 1.06.
 - B. When applying for a small business loan, the company must report a 10 year business model. In ten years, what are their projections for annual sales?
5. In 2002, the student enrollment in a local high school was 970 students and increases by 1.2% per year. This growth is represented by the equation $y = 970 \cdot (1.012)^x$.
 - A. When student enrollment reaches 1200, the district must consider plans for building a new high school. When will the district begin making these plans?
 - B. The 1000th student to enroll will receive a free graphing calculator as a prize. In which year is this projected to occur?

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