

Date: _____

Today's Learning Goal(s):

By the end of the class, I will be able to:

- a) describe the characteristics of the graphs and equations of exponential functions.

Last day's Assigned Practice: pp. 240-241 A - P
p. 243 #1, 2

16

- p. 243 1. Use differences to identify the type of function represented by the table of values.

b)

x	y
-5	32
-4	16
-3	8
-2	4
-1	2
0	1

FD

y ratios

$$16 - 32 = -16$$

$$\frac{-8}{-16} = \frac{1}{2}$$

$$8 - 16 = -8$$

$$\frac{-4}{-8} = \frac{1}{2}$$

$$4 - 8 = -4$$

$$\frac{-2}{-4} = \frac{1}{2}$$

$$2 - 4 = -2$$

$$\frac{-1}{-2} = \frac{1}{2}$$

$$1 - 2 = -1$$

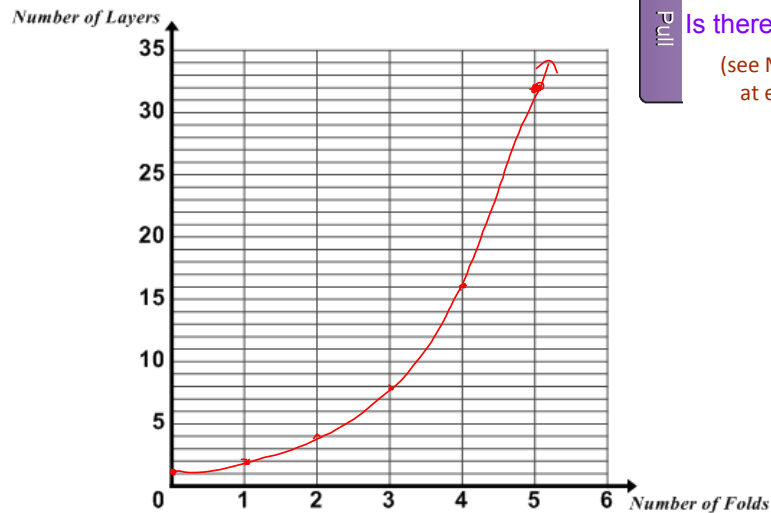
\therefore the y-ratios are constant
 \therefore the table represents an exponential relation

4.1 Exploring Growth and Decay

Date: Oct. 29/19

Ex. 1: Take a sheet of paper. Fold it in half. Count the number of layers formed. Fold it in half again and repeat. Complete the table. Draw a graph of the number of layers versus the number of folds.

Number of folds	Number of layers
0	1
1	2
2	4
3	8
4	16
5	32
n	



Is there a maximum?
(see MythBusters at end of file)

n	L	1st Differences	2nd Differences	y-ratios
0	2^0 1			$\frac{2}{1} = 2$
1	2^1 2	$2 - 1 = 1$		$\frac{4}{2} = 2$
2	2^2 4	$4 - 2 = 2$	$2 - 1 = 1$	$\frac{8}{4} = 2$
3	2^3 8	$8 - 4 = 4$	$4 - 2 = 2$	$\frac{16}{8} = 2$
4	2^4 16	$16 - 8 = 8$	$8 - 4 = 4$	$\frac{32}{16} = 2$
5	2^5 32	$32 - 16 = 16$	$16 - 8 = 8$	
n	$L = 2^n$			

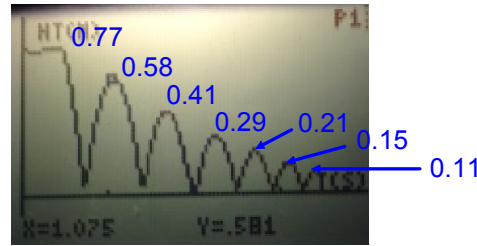
↑
Growth Factor

the y-ratios are constant

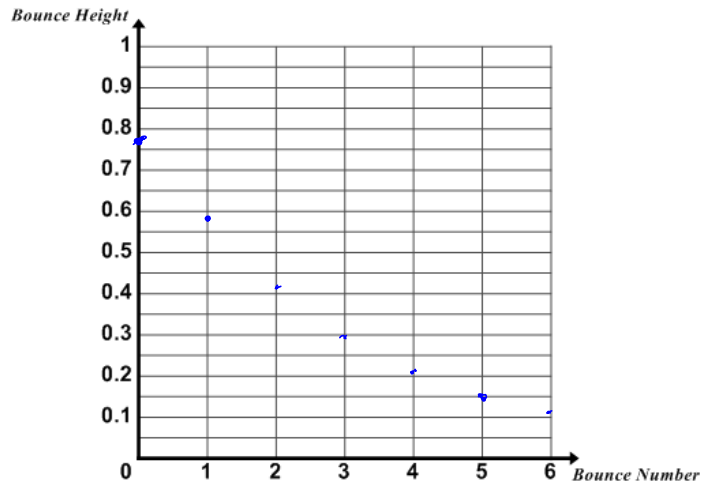
the table represents an exponential relation

Recall: An exponential function has the variable **n** in the exponent.

Ex. 2: Ball Bounce. Let a ball drop. Record the height after each bounce. Graph the height versus the bounce number.



Bounce number	Bounce height	y-ratios
0	0.77	
1	0.58	$\frac{0.58}{0.77} = 0.75$
2	0.41	$\frac{0.41}{0.58} = 0.71$
3	0.29	$\frac{0.29}{0.41} = 0.71$
4	0.21	$\frac{0.21}{0.29} = 0.72$
5	0.15	$\frac{0.15}{0.21} = 0.71$
6	0.11	$\frac{0.11}{0.15} = 0.73$



Initial Amount Decay Factor

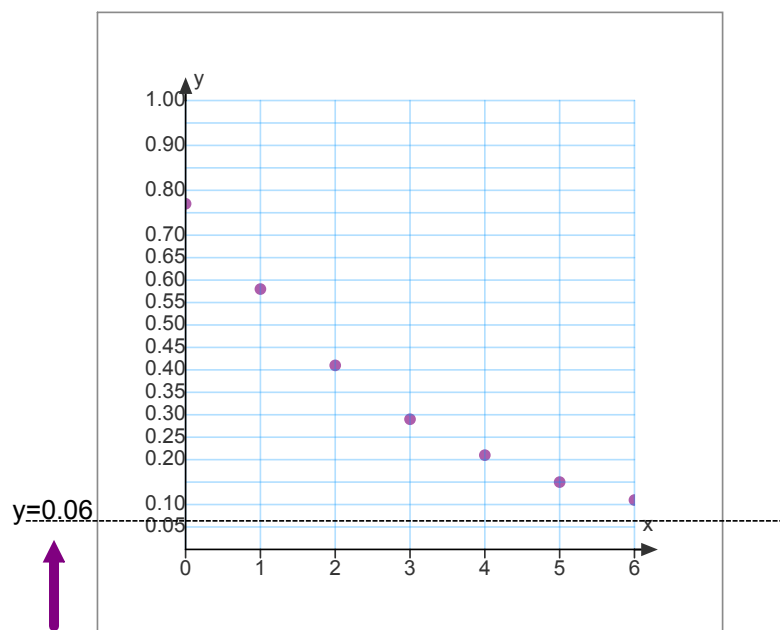
↓ ↓

$$h = 0.77(0.72)^n$$

$$y = ab^x$$

$$h(n) = ab^n$$

Bounce Number	Bounce Height
0	0.77
1	0.58
2	0.41
3	0.29
4	0.21
5	0.15
6	0.11



Somebody remember to ask me why $y=0.06$ and not $y=0$

Are there any questions from last day's assigned work you would like to see on the board?

Last day's assigned practice: pp. 240-241 A - P
p. 243 #1, 2

MythBusters (max. folds=7)



Today's Assigned Practice includes:

pp. 214-215 A – H

p. 216 #1, 2

DESMOS Activity?