Name: KEY Date:

UNIT 5 LESSON 8

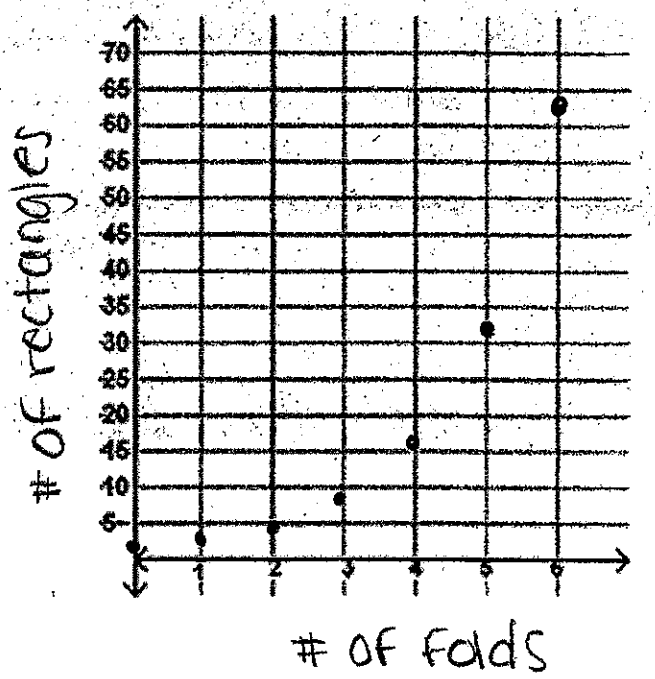
AIM: HOW DO WE GRAPH AND INTERPRET EXPONENTIAL EQUATIONS?

Using a piece of paper, determine the number of sections you have after folding it in half each time. After each fold, record the number of sections formed. Record this information in the table below and then graph the coordinates on the graph provided.

# of folds	# rectangles
0	1
1	2
2	4
3	8
4	16
5	32
6	64

r=2

×2 ×2 ×2 ×2 ×2 ×2 exponential graph



$y = b^x$ is an expontial equation because it contains an "x" in the exponent

2. Graph $y = 3^x$ $\{-2 \le x \le 2\}$

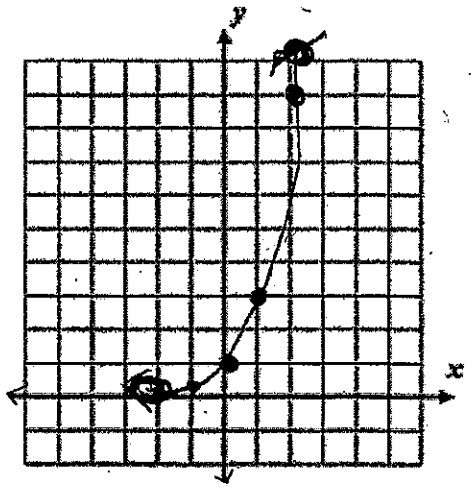
x	y
-2	.111
-1	.3333
0	1
1	3
2	9

exponential growth

$y = 3^x$

↓

common ratio



IF b > 1 (b-value is greater than one) the graph will be exponential grauth

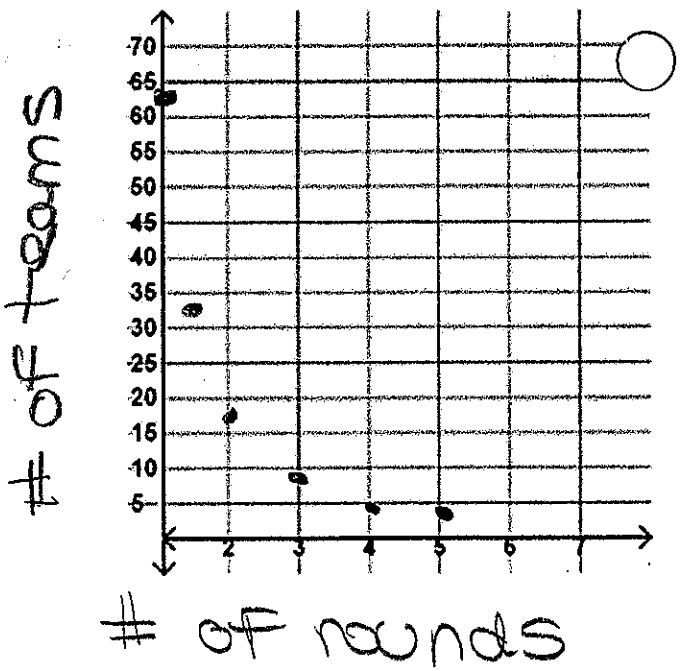
3. During March Madness, (the NCAA Basketball Tournament) teams play against one another with **only** the winning teams progressing to the next round. The tournament starts with 64 teams. After each round, the number of teams playing at each round is half of the number of teams playing in the previous round. How many teams are left in the tournament by round 5?

# of rounds	# of teams left
0	64
1	32
2	16
3	8
4	4
5	2

$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

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

exponential Graph



4. Graph $y = \left(\frac{1}{3}\right)^x \{-2 \le x \le 2\}$

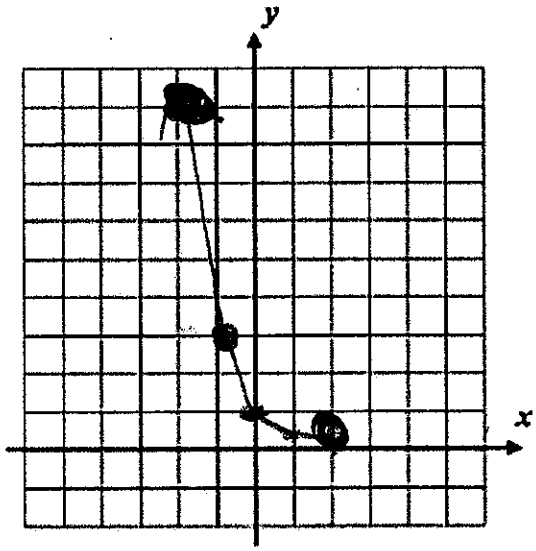
$y = (\frac{1}{3})^x$

↓

common ratio

x	y
-2	9
-1	3
0	1
1	$\frac{1}{3}$
2	$\frac{1}{9}$

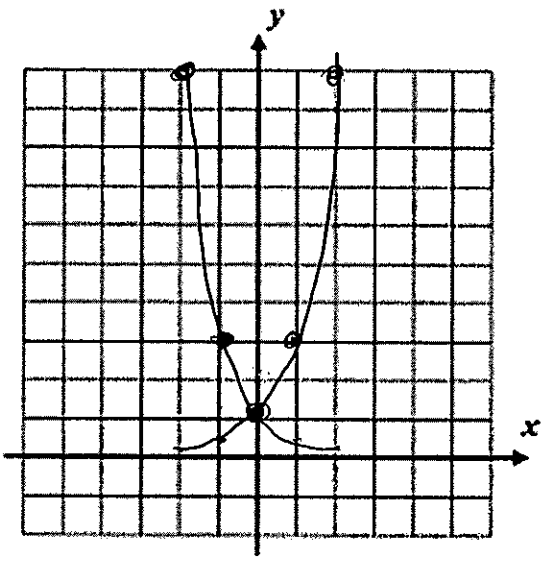
$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$



IF $0 < b < 1$ (b-value is greater than zero, but less than one) then the graph will be exponential decay

5. Graph $y = 3^x$ $\{-2 \le x \le 2\}$

6. Graph $y = \left(\frac{1}{3}\right)^x$ $\{-2 \le x \le 2\}$



- $y = b^x$ and $y = \frac{1^x}{b}$ are always reflection over the y-axis
- An equivalent equation to $y = \left(\frac{1}{3}\right)^x$ is: $y = 3^{-x}$.
- When the interval is given No arrows.

7. Write an equation that would be a reflection in the y-axis of $y = 5^x$: $y = \frac{1}{5}^x$ or $y = 5^{-x}$

8. Identify which of the following equation is an exponential equation.

(1.) $y = (0.5)^x$ 2. $y = (-2)^x$ 3. $y = \left(\frac{1}{3}\right)^2$ 4. $y = (4x)^x$

Explain your answer: X → is in the exponent

9. Identify which table represents an **exponential** equation.

a.

n	0	1	2	3	4	5
A(n)	-1	1	3	5	7	9

+2 +2 +2 +2

(b.)

n	0	1	2	3	4	5
A(n)	1	4	16	64	256	1024

.4 .4 .4 .4 .4

10. Identify which of the following equations represent either growth or decay. Explain your answer.

	Equation	Growth (G) or Decay (D)	Explanation
a)	$y = .65^x$	D	$0 < b < 1$
b)	$y = 1.25^x$	G	$b > 1$
c)	$y = \left(\frac{5}{2}\right)^x$	G	$b > 1$
d)	$y = \left(\frac{1}{4}\right)^x$	D	$0 < b < 1$
e)	$y = \left(\frac{2}{3}\right)^x$	D	$0 < b < 1$
f)	$y = \left(\frac{7}{3}\right)^x$	G	$b > 1$