Algebra I
Notes 2.1
Linear and Exponential Functions

NAME:_____

DATE:_____ HOUR:____

Objective: Identify and compare linear and exponential functions.

Problem: You have won a contest. Should you pick Prize A or Prize B?

Prize A: You get $100 the first day. Each day you get $100 more than the previous day.

Prize B: You get 1 penny the first day. Each day you get double the amount from the previous day.

Complete these tables to make your decision.

Prize A

day	day amount	total amount
1	100	100
2	200	300
3	300	600
4	400	
5	500	
6		
7		
8		
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17		
18		
19		
20		

What is the rule for the sequence of day amounts?

_____

Prize B

day	day amount	total amount
1	0.01	0.01
2	0.02	0.03
3	0.04	0.07
4	0.08	
5	0.16	
6		
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What is the rule for the sequence of day amounts?

_____

Which prize is growing at a fixed **amount** (**adding** the same amount each day)? _____

Which prize is growing at a fixed **rate** (**multiplying** by the same amount each day)? _____

> Sequences that grow at a **fixed amount** (the rule is adding or subtracting) are called _____ relationships.
>
> Sequences that grow at a **fixed rate** (the rule is multiplication or division) are called _____ relationships.

Write the rule for each sequence then determine if it is linear or exponential.

1. 1, 4, 7, 10, 13, . . . _____ linear/exponential
2. 2, 4, 8, 16, 32, . . . _____ linear/exponential
3. 5, 3, 1, -1, -3, . . . _____ linear/exponential
4. 100, 10, 1, .1, . . . _____ linear/exponential

5. A basketball is dropped from a height of 24 feet. Each time the ball bounces, the height of the bounce is ½ the height of the previous bounce. How high will the ball go after

   1 bounce? _____ feet 2 bounces? _____ feet 3 bounces? _____ feet

6. Write the sequence you would get if you start with 3 and **double** each number.

   3, _____, _____, _____, _____, . . . type of sequence? _____

7. Write the sequence you would get if you start with 3 and **add two** to each number.

   3, _____, _____, _____, _____, . . . type of sequence? _____

8. Write the sequence you would get if you start with 30 and **subtract ten** each time.

   30, _____, _____, _____, _____, . . . type of sequence? _____

9. Write the sequence you would get if you start with 200 and **divide by two** each time.

   200, _____, _____, _____, . . . type of sequence? _____