

## Which Would You Choose?

DO NOT WRITE ON THIS PAPER!

Your rich uncle, Earl Exponential, has bequeathed you with part of his fortune. He will add money into your bank account each day *for an unspecified amount of time*. He has two different monetary offers for you to choose from:

### Option A

He gives you \$1 to start. Each day after that, he will give you enough money so that your bank account has \$2 on the first day, \$4 on the second day, \$8 on the third day, \$16 on the fourth day, and so on.

### Option B

He will give you \$1,000,000 to start. Each day after that, he will give you \$50,000.

- 1) Uncle Earl just called, and he wants to know NOW which option you are choosing. Quick! Make your choice; Option A or Option B? **Explain why you made the choice you did.**
- 2) After you get off the phone with Uncle Earl, you start to wonder if you made the right choice. You decide to do a little math. You create a table for 10 days for each option. Copy and complete both tables.

<u>Option A</u> (Starting Amount: \$1)	
<u>Day</u>	<u>Money in Account</u>
<b>1</b>	\$2
<b>2</b>	
<b>3</b>	
(rows 4-9 here)	
<b>10</b>	

<u>Option B</u> (Starting Amount: \$1,000,000)	
<u>Day</u>	<u>Money in Account</u>
<b>1</b>	\$1,050,000
<b>2</b>	
<b>3</b>	
(rows 4-9 here)	
<b>10</b>	

- 3) Compare the values in the two tables. Do you still think you made the right choice? **Explain.**
  - 4) For some reason, you're still not sure if you made the right choice, so you extend the pattern. How much will you have on Day 20 for each option? (You don't have to write down all the days in between.) Which is larger?
  - 5) Do you think it will stay this way? **Explain.**
  - 6) Extend the pattern for each option for a few more days. What happens?
  - 7) You are now sure about which option was better. Did you make the right choice? Why or why not?
  - 8) If Uncle Earl is still paying you on Day 30, what is the difference between the amounts in the bank accounts?
  - 9) Uncle Earl was adding money *for an unspecified amount of time*. For how many days was Option B better than A? For how many days is option A better than option B?
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- 10) One of Uncle Earl's options was linear and one of them was exponential. Which one is linear? **Explain.**
  - 11) Describe the growth of Option A. How is this type of growth different than a linear situation?
  - 12) What if you had started with 1 penny in Option A? Would this still have been the best choice? **Explain.**
  - 13) Write an equation for Option B where **x** is the # of days and **y** is the amount of money after that many days.
  - 14) (Bonus) Can you come up with an equation for Option A?