Name: _____ **Date:** _____ **Period:**_____

GG Problem 3.1 Notes

In 1859, English settlers introduced a small number of rabbits to Australia. The rabbits had no natural predators in Australia, so they reproduced rapidly and ate grasses intended for sheep and cattle.

Suppose biologists had counted the rabbits in Australia in the years after English settlers introduced them. The biologists might have collected data like those shown in the table.

A. The table shows the rabbit population growing exponentially.

Time (n)	Population (p)
0	100
1	180
2	325
3	583
4	1050

1. What is the growth factor? Explain how you found your answer.

2. Assume this growth pattern continued. Write an equation for the rabbit population *p* for any year *n* after the biologists first counted the rabbits. Explain what the numbers in your equation represent.

3. How many rabbits will there be after 10 years? How many will there be after 25 years? After 50 years?

4. In how many years will the rabbit population exceed one million?

B. Suppose that, during a different time period, biologists could predict the rabbit population using the equation $p = 15(1.2)^n$, where *p* is the population in millions, and *n* is the number of years.

1. What is the growth factor?

2. What was the initial population?

3. In how many years will the initial population double?

4. What will the population be after 3 years? After how many more years will the population at 3 years double?

5. What will the population be after 10 years? After how many more years will the population at 10 years double?

6. How do the doubling times for parts (3)-(5) compare? Do you think the doubling time will be the same for this relationship no matter where you start the count? Explain your reasoning.