Pre-Calculus 3.1 Together Name:_____

1. In 2017, the number of people in Illinois was 12.8 million. The state's population is estimated to be growing at 0.88% annually.

a. Assuming the rate of increase stays the same, predict the population in 2020.

b. Assuming the rate of increase stays the same, predict the population in 2030.

2. Determine the amount of money in a savings account that provides an annual rate of 4.25% compounded weekly if the initial deposit is $1500 and the money is left in the account for 5 years.

3. Compare the balance after 10 years of a $5000 investment earning 8.5% interest compounded continuously to the same investment compounded quarterly.

a) Continuously: b) Quarterly:

4. In 2007, it is estimated that the United States used about 101,000 quadrillion thermal units. If U.S. energy consumption decreases at a rate of about 0.5% annually, what amount of energy will the United States use in 2020?

5. A population of 300 is decreasing at a continuous rate of 5%. Find the amount left in the population after 7 years.

6. The population of a town is increasing at a rate of 1.5% annually. The current population in 2017 is 52,356 people. Predict the year in which the population will triple.

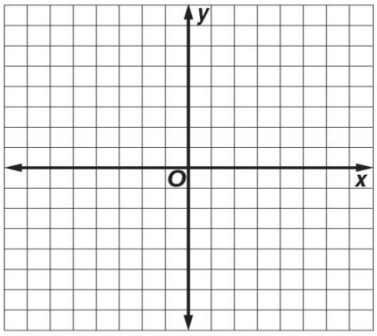
7. The data in the table shows a population growing exponentially. Identify the growth rate.

Then, find the population for the year 2020.

Year	Population (in millions)
2000	5.1
2008	8.1

8. Analyze the graph of $g(x) = -e^{(x+1)} - 4$ and find the following information. Then graph it.

$e^1 \approx 2.7, e^{-1} \approx .4$



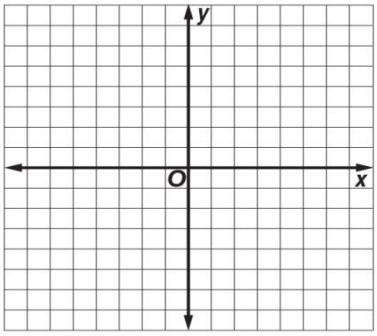
Transformations:_____ **Type:** growth/decay

End Behavior:_____ _____

Increasing:_____ Decreasing:_____

Domain:_____ Range: _____ Asymptote Equation: _____

9. Analyze the graph of $g(x) = \left(\frac{1}{3}\right)^{x-2} + 4$ and find the following information. Then graph it.



Transformations:_____ **Type:** growth/decay

End Behavior:_____ _____

Increasing:_____ Decreasing:_____

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