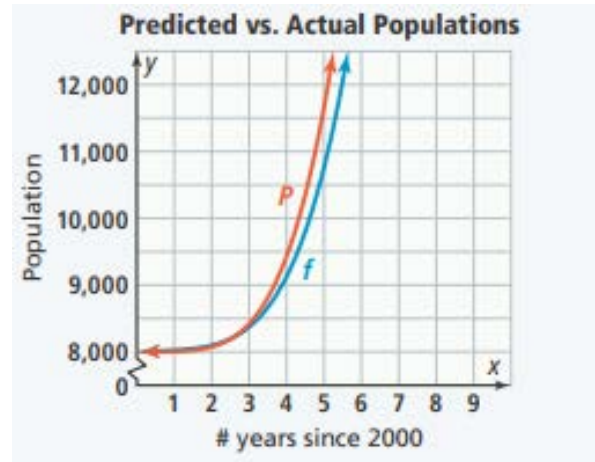


Name: _____

Date: _____

In the year 2000, a demographer predicted the estimated population of a city, which can be modeled by the function $f(x) = 5x^4 - 4x^3 + 25x + 8,000$. Several years later, a statistician, using data from the U.S. Census Bureau, modeled the actual population with the function $P(x) = 7x^4 - 6x^3 + 5x + 8,000$. The graphs of the functions are shown.



Part A: What is the y-intercept of each function, and what does it represent?

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Part B: Identify the end behaviors of f and P .

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Part C: Compare the average rates of change of f and P from 2003 to 2005.

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Grows	Glows

Task is worth a total of **5 points**.

Rubric Part A	
Score	Description
1	<p>Student response includes the following elements</p> <ul style="list-style-type: none"> ❖ Computation component = 1 point <p>Identifying the y-intercepts. And Interpreting the y-intercept as the population in 2000</p> <p>Sample Student Response: The y-intercept for both functions is 8,000, which represents the population of the city in 2000.</p>
0	Student response is incorrect or irrelevant

Rubric Part B

Score	Description
1	<p>Sample Student Response: Include behaviors for both functions f and P.</p> <ul style="list-style-type: none"> For both functions, as $x \rightarrow \infty$, $y \rightarrow \infty$. The end behavior for $x \rightarrow -\infty$ is not relevant because the graphs of both functions begin at the y-intercept, (0, 8,000)
0	Student response is incorrect or irrelevant

Rubric Part C

Score	Description
3	<p>Student response includes the following elements</p> <ul style="list-style-type: none"> ❖ Computation component = 1 point Calculating the correct rate of change for Function f ❖ Computation component = 1 point Calculating the correct rate of change for Function P ❖ Reasoning component = 1 point Correct comparison of the the average rate of change. <p>Sample Student Response: Function P's average rate of change, approximately 1,500, is greater than f's average rate of change, which is about 1,200.</p>
2	Student response includes 2 of the 3 elements
1	Student response includes 1 of the 2 elements
0	Student response is incorrect or irrelevant

Genesis Convert Table

Task Point	Genesis Score
0	55
1	59
2	69
3	79
4	89
5	100